Control/Communicator D7212G

Operation and Installation Guide



Contents

Contents

Contents

Contents

Contents

Figures

Contents

Tables

1.0 Introduction

This guide addresses the operation and installation of the D7212G Control/Communicator only and should not be used in conjunction with the D9412G, D7412G, D9412, D9112, D9112B1, D7412, D7212 or D7212B1 Panels.

Throughout this guide, unless expressly stated, the words "panel" and "control/communicator" refer to the D7212G.

Section 2.1 9000G Series Panel Differences on page 13 provides an overview of the differences between the D9412G, D7412G, and D7212G panels.

1.1 Guide Organization

This guide is divided into sections and appendices, summarized in *Table 1*.

Section	Description
1	Introduction – provides information on the structure of the guide, lists other literature related to this control/communicator, and describes the FCC rules with which it complies.
2	Overview – provides an overview of the D7212G Control/Communicator, including operational specifications and standard features.
3	Installation – provides installation instructions for connecting the power terminals plus the status and battery LEDs.
4	Power Supply – provides information on the primary and secondary modules and instructions on connecting and programming them.
5	Power Outputs – provides information on the power outputs and instructions on installing the transformer; explains the status and battery LEDs.
6	Telephone Connections – provides information on connecting the phone line and programming it for use.
7	On-Board Points – provides information on the on-board points and their parameters.
8	Off-Board Points – provides information on the off-board points and their parameters, including the installation, wiring and testing of OctoPOPITs.
9	Off-Board Relays – describes the installation and wiring of the D8129 OctoRelay.
10	Arming Devices – describes the installation, wiring, programming and operation of independent zone control modules.
11	SDI Devices – provides a description and installation instructions for various SDI device modules.
12	Programmer and Accessory Connections – describes the Programmer Connector and the Accessory Connector.
13	Faceplate – provides an illustration of the D7212G panel
Appendix	Description
A	System Wiring Diagrams – illustrations showing the terminal wiring connections for the D7212G.
B	Point Address Chart – provides ZONEX point addresses for POPITS.

Table 1: D7212G Operation and Installation Guide Organization

Introduction

1.2 Related Documentation

Table 2 is a comprehensive list of all documentation (with part numbers) directly related to the D7212G Control/ Communicator. Throughout this guide, references are made to this documentation. If you need one or more of these documents, please contact Bosch Security Systems Technical Support and request the documentation by part number.

Name of Document	Part Number
D1255 Installation Instructions	74-06819-000
D1256/D1257 Installation Instructions	74-06925-000
D1260 Installation Guide	48101
D5200 Operation Manual	74-06176-000
D720 Installation Instructions	74-06918-000
D7212G Approved Applications Compliance Guide	4998138560
D7212G Operation and Installation Guide (this document)	4998138544
D7212G Program Entry Guide	4998138538
D7212G Program Record Sheet	4998138542
D7212G Release Notes	4998138543
D8125MUX Operation and Installation Guide	36796
D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide	43700
RAM IV Operations Manual	38849
Security System Owner's Manual	71-06633-000
Security System Owner's Manual Supplement	33267
7000/9000 Series Point Chart Label	79-06660-000
9000/9000G Series Technogram: UL Certificated Bank Safe and Vault Applications	73-07302-000
9000/9000G Series Technogram: Smoke Detector Compatibility	33284

Table 2: Related Documentation

1.3 Documentation Conventions

1.3.1 Type Styles Used in the Text

Special type styles are used to help identify the objects being described in this guide.

Bold Text	Usually indicates selections that you may use while programming your panel. May also indicate an important fact that should be noted.
Bold Italicized Text	Denotes notes, cautions and/or warnings.
Italicized Text	Refers you to a drawing, table, or other section of this document, or to another document. Also used to symbolize names for records that you will create.
`Courier New Text`	Indicates what may appear on the D5200 Programmer display, command center/keypad or internal printer.
[CAPITALIZED TEXT]	Indicates a specific key to be pressed.

1.3.2 Tips, Notes, Cautions and Warnings

Throughout this document helpful tips and notes will be presented concerning the entire application and/or programming the unit. They will be set off as follows:

Application Note

Application Notes should be heeded for successful operation and programming. Helpful tips and/or shortcuts may be included here.

CAUTION

Cautions the operator that physical damage to the equipment or improper execution of the program may occur.

WARNING

Warns of possible of physical damage to the operator, equipment and/or proper execution of the program.

1.4 FCC Rules

1.4.1 Part 15

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the *Operation and Installation Guide*, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

1.4.2 Part 68

This equipment complies with Part 68 of FCC rules. A label contains, among other information, the FCC registration number and ringer equivalence number (REN). If requested, this information must be provided to the telephone company.

The Bosch Security Systems D7212G Control/Communicator is registered for connection to the public telephone network using an RJ38X or RJ31X jack.

The ringer equivalence number (REN) is used to determine the number of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5). To be certain of the number of devices that may be connected to the line, as determined by the RENs, contact the telephone company to determine the maximum REN for the calling area.

If trouble is experienced with the D7212G Control/Communicator, please contact Bosch Security Systems Customer Service for repair and/or warranty information. If the trouble is causing harm to the telephone network, the telephone company may request that the equipment be removed from the network until the problem is resolved. User repairs must not be made, and doing so will void the user's warranty.

If the D7212G Control/Communicator causes harm to the telephone network, the telephone company will attempt to notify you in advance. If advance notice isn't practical, the telephone company will notify you as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for the necessary modifications to be made in order to maintain uninterrupted service.

This equipment cannot be used on public coin service provided by the telephone company. Connection to Party Line service is subject to state tariffs. (Contact your state public utilities commission for information.)

FCC Registration Number:	AJ9MUL-46532-AL-E	Service Center in USA:	National Repair Center 130 Perinton Parkway Fairport, NY 14450-9199 (585) 223-4220
Ringer Equivalence:	0.1B		

Notes:

2.0 Overview

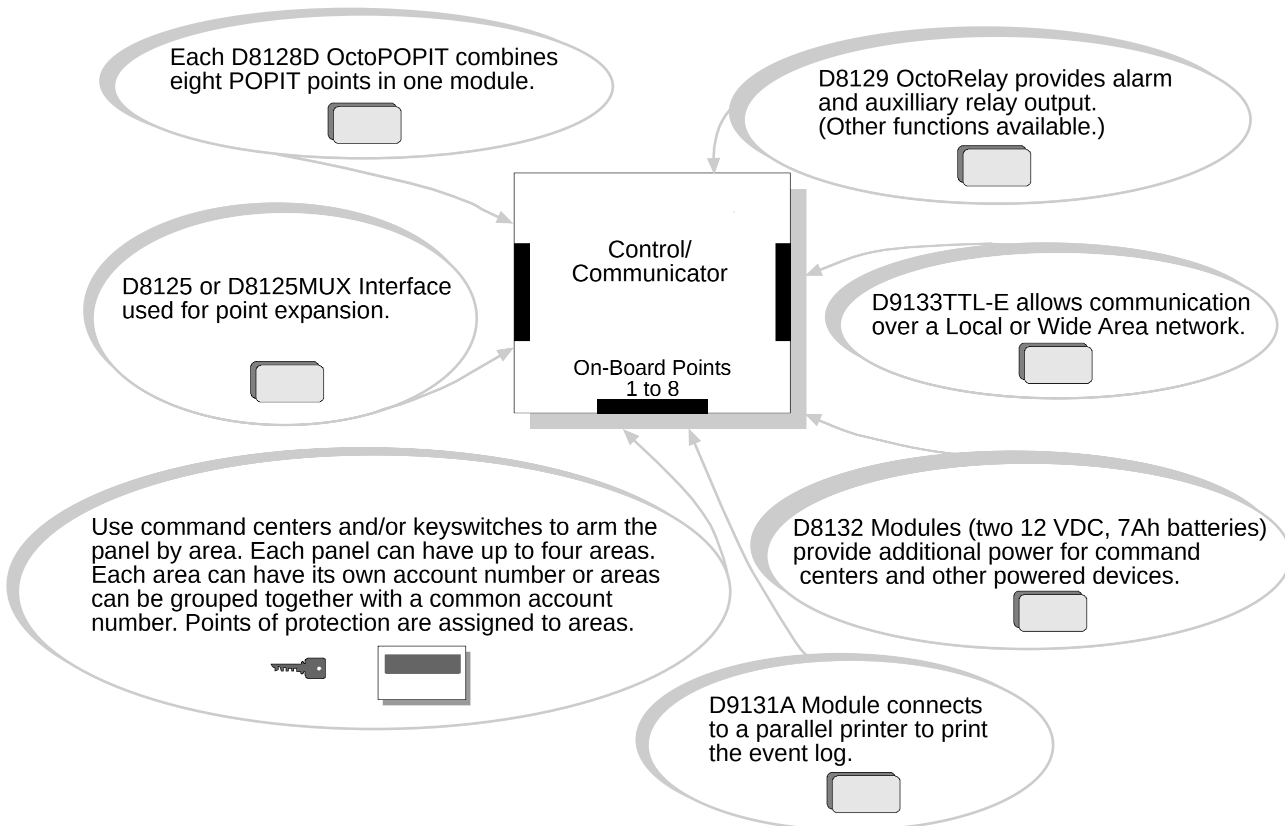


Figure 1: System Configuration

2.1 9000G Series Panel Differences

Table 3 provides an overview of the differences between the D9412G, D7412G, and D7212G Panels.

New Features	D9412G	D7412G	D7212G
Access Control	YES, 8 Doors	YES, 2 Doors	NO
Expanded Users Arm/Disarm Passcodes Cards/Tokens	 249 996	 99 396	 99 N/A
Passcode-Protected Custom Functions	16	4	4
Number of Printers	3	1	1
Number of Points	246	75	40
Number of Relays	128	64	24

Table 3: Differences between the 9000G Series Panels

2.2 Specifications

(The black and white circles with numbers indicate the specific panel terminal.)

Voltage Input (Power Supply)	Primary:	1, 2	16.5 VAC 40 VA class 2 plug-in transformer (D1640)
	Secondary:	4, 5	Sealed lead-acid rechargeable (12 VDC, 7 Ah or 12 VDC, 17.2 or 18 Ah) battery. The panel supports a maximum of two 12 VDC, 7 Ah batteries using the D122 Dual Battery Harness or two D1218 (12 VDC, 17.2 or 18 Ah) batteries using a D122.
Current Requirements	Panel : 500 mA alarm, 200 mA idle See *Section 4.1 Current Rating Chart for Standby Battery Calculations* in *the D7212G Approved Applications Compliance Guide* (P/N: 4998138560) for the current draw requirements of other system components.		
Power Outputs	All external connections are inherently power-limited except battery terminals.		
	Continuous Power Outputs	3, 32	1.4 A maximum at 10.2 VDC to 13.9 VDC (continuous supply) total for all devices and outputs supplied at Terminals 3 and 32 and at the Programming Connector.
	Alarm Power Output	6, 7	2.0 A maximum at 10.2 VDC to 13.9 VDC output. Output may be steady or one of three pulsed patterns depending on programming. See *Relays* in the *D7212G Program Entry Guide* (P/N: 4998138538).
	Switched Aux Power	8	1.4 A maximum at 10.2 VDC to 13.9 VDC output. Continuous output is interrupted by Sensor Reset or alarm verification depending on programming. See *Relays* in the *D7212G Program Entry Guide* (P/N: 4998138538).
	Fire and Fire/Burglary Systems	To comply with UL 985 listing standard for fire alarm systems (effective March 1, 1989), the total combined continuous and alarm current draw for the system during alarm conditions must be limited to 1.4 A (1400 mA) provided by the primary power supply (rectified AC). If current draw for the system exceeds 1.4 A, remove connected devices until the current draw falls below 1.4 A, then connect the removed devices to a D8132 Battery Charger Module or to an external power supply (see *Figure 17* on page 54).	
Minimum Operating Voltage	10.2 VDC		
SDI Bus	SDI Bus A (+): SDI Bus B (-):	9 VDC (15000 ft. [4572 m] max.) 9 VDC (15000 ft. [4572 m] max.)	

Table 4: Specifications

Telephone Connections	Telephone Line Connection		RJ31X or RJ38X jack can be interfaced with the panels. Supervision supplied by the panel.
Battery Discharge/Recharge Schedule	Discharge Cycle	13.9 VDC 13.8 VDC 12.1 VDC 10.2 VDC	Charging float level Charging Status LED on Low Battery & AC Fail reports if programmed, Low Battery LED on Battery load shed (processing functions continue if AC is present)
	Recharge Cycle	AC ON 13.7 VDC 13.9 VDC	Load shed relay resets battery charging begins, Battery Trouble and AC Restoral reports sent. Battery Restoral report sent, Low Battery LED off Charging Status LED off, battery float charged
Environmental	Temperature: Relative Humidity:	+32°F to +122°F (0°C to +50°C) 5% to 85% @ +86°F (+30°C) non-condensing	
Arming Stations	D1255 Command Center; D1256 Fire Command Center; D1257 Fire Alarm Annunciator; D1260 Alpha V Command Center; D720 Command Center; Keyswitch		
Point Thresholds	On board Points 1 to 8	Open Normal Short	Greater than 3.7 VDC, but less than 5.0 VDC. Greater than 2.0 VDC, but less than 3.0 VDC. Greater than 0.0 VDC, but less than 1.3 VDC.
Compatible Enclosures	D8103 Universal Enclosure, D8109 Fire Enclosure, D8108A Attack Resistant Enclosure		

Table 4 (cont'd.): Specifications

2.2.1 Compatible Accessories

See the *Bosch Security Systems Intrusion Catalog* for a complete list.

D122	Dual Battery Harness	D1256	Fire Command Center
D125B	Powered Loop Interface Module	D1257	Fire Annunciator
D126	12 V, 7 Ah Rechargeable Battery	D1260	Alpha V Command Center
D127	Reversing Relay	D1640	16.5 VAC 40 VA Transformer
D129	Dual Class A Initiation Circuit Module	D5200	Programmer
D130	Relay Module	D5500	Remote Account Manager IV
D136	Plug-In Relay	D8004	Transformer Enclosure
D161	Phone Cord	D8121A, D8122	Derived Channel STU
D162	Phone Cord	D8125	POPEX Module
D185	Reverse Polarity Module	D8125MUX	Multiplex Bus Interface
D192C/D192G	Bell Circuit Supervision Module	D125INV*	Wireless Interface Module
D279A	Independent Zone Control (On-Board and OctoPOPIT Points)	D8128D	OctoPOPIT Module
D442	Bells (10 in.)	D8129	OctoRelay Module
D448/D449	Mini-Horns	D8130	Release Module
D720	Command Center (Area LED)	D9127U/T	POPIT Module
D720R	LED Command Center (red)	D9131A	Parallel Printer Interface Module
D720W	LED Command Center (white)	ZX776Z	PIR Motion Sensor (50 ft.) with POPIT
D1218	12 V, 17.2 Ah Rechargeable Battery	ZX794Z	PIR Motion Sensor (80 ft.) with POPIT
D1255	Command Center (General Purpose)	ZX835	PIR/Microwave Motion Sensor (35 ft.)
D1255R	Command Center (red)	Z938Z	PIR Motion Sensor (60 ft.) with POPIT
D1255W	Command Center (white)	ZX970	PIR/Microwave Motion Sensor (70 ft.) with POPIT
			* The D8125INV has not been investigated by UL. Not to be used in UL Listed installations.

2.3 Features in D7212G

2.3.1 Introduction

The Bosch Security Systems D7212G Control/Communicator provides up to 40 points of protection and supports up to four separate areas. The panel is armed and disarmed by area, and several areas can be armed and disarmed with one menu function. The D7212G uses a built-in digital communicator to send reports to the receiver. A maximum of 32 unsupervised command centers can be connected to the system.

2.3.2 Ground Fault Detect

In order for the D7212G to be able to detect ground fault conditions, the Earth Ground Terminal on the control/ communicators had to be electrically isolated from all other terminals. A Ground Fault Detect Enable switch (S4) has been added to the panel and is located just under Terminal 10, Earth Ground. For more information on the operation of this function, see *Section 3.5.2 Ground Fault Detect Enable* on page 22.

2.3.3 Added Feature When Using Ground Fault Detect

When Ground Fault Detect is enabled (S4 closed), Points 1-8 can be used for non-powered fire-initiating devices, such as Heat Detectors, 4-Wire Smoke Detectors, Pull Stations, etc. A D125B Powered Loop Interface or a D129 Dual Class A Interface Module is no longer required when connecting non-powered fire-initiating devices to Points 1 through 8.

2.3.4 NetCom Functionality

The D6600 NetCom System supports data network communications. NetCom allows the D6600 Receiver to connect to various network topologies, specifically Ethernet and Token Ring, and to process messages both to and from most networks using TCP/IP protocols. Connection to a data network can be implemented through the use of the COM4 and/or a COM1 connection from the D6600 Receiver to the D6680 Network Adapter. Reports from alarm control panels via phone lines OR Ethernet and Token Ring data networks can be sent to the D6600 Receiver and onto the central station automation software and/or the network printer via LAN or WAN. Alarm control panels can be monitored on the network for their status.

2.4 Standard Features

2.4.1 Points

The Bosch Security Systems D7212G Control/Communicator provides up to 40 points of protection. Point programming parameters determine the panel's response to open and shorted conditions on the point's sensor loop. Points are programmed individually with several options to custom-fit the protection to the installation.

Points 1 to 8 are located on the circuit board (on-board points). They are standard sensor loops. The remaining off-board points are POPIT points using D8128D OctoPOPITs, D8125 POPEX Modules and D9127/D8127 POPITs. MUX devices may also be used with the D8125MUX or wireless transmitters with the D8125INV.

2.4.2 Areas and Accounts

The system supports up to four separate areas. All points can be assigned to a single area or spread out over up to four areas.

The panel is armed and disarmed by area, and several areas can be armed and disarmed with one menu function. A passcode can also be assigned an authority level that allows a user to arm an area from a remote command center in another area. Assigning each area its own account number creates eight separate accounts in one panel. Assigning the same account number to different areas groups them together in a single account.

Area options include: exit tone and delay, separate fire and burglary outputs, and multiple opening and closing windows. Area type can be used to create area interdependencies.

2.4.3 Communicator

The control/communicator uses a built-in digital communicator to send reports to the receiver. The panel transmits reports in either the Modem IIIa^2 or BFSK format. The D6500 receiver's MPU and line cards must have software revision 8.00 (or greater) installed to accept Modem IIIa^2 reports from the panel. Cycle the receiver's down to print the software revision numbers.

The panel connects to an RJ31X or RJ38X jack for phone line seizure. Connection to the RJ31X complies with FCC regulations for using the public telephone network. The panel can be programmed to direct reports to four separate phone numbers.

The system has routing capabilities that allow groups of event reports to be directed to four different destinations. Each of the report groups can be programmed to report to one or more of the destinations. Primary and backup reporting paths can be programmed for each of the destinations and each of the report groups. A custom option allows specification of individual event reports to be sent.

Overview

2.4.4 Command Centers

A maximum of 32 unsupervised command centers can be connected to the system. The available power, number of supervised command centers, and number of areas that will be used, affect the total number of command centers that can be connected.

The system can supervise up to eight command centers. The panel transmits a serial device trouble report SDI FAILURE in the Modem IIIa[2] format or TROUBLE ZN D in the BFSK format, if it loses communication with a supervised command center. More command centers can be added, but only eight can be supervised. *Table 5* shows the command centers compatible with the D7212G Control/Communicator. See *Command Center* in the *D7212G Program Entry Guide* (P/N: 4998138538) for complete details on programming command center options.

Model	Display	Application
D1255	16-character alphanumeric	Fire/Burglary/Access
D1256	16-character alphanumeric	Fire
D1257	16-character alphanumeric	Fire
D1260	4-line by 20-character alphanumeric	Fire/Burglary
D720	8 LED	Fire/Burglary

Table 5: Compatible Command Centers

2.4.5 Keyswitch

Any of the four available areas can be armed and disarmed with maintained or momentary closure devices such as keyswitches. Point programming determines loop responses and which area a keyswitch controls.

2.4.5 Event Memory

The system uses event memory to store events for each area. The events for an area can be viewed at a D1255 or D1260 Command Center assigned to the area. The panel clears the events for an area from event memory and starts storing new events when the area is master armed.

2.4.7 Event Log

The system stores from 500 to 1000 events and event modifiers from all areas in its event log. Event modifiers add information about an event to the log. Some events are always followed by a modifier. For example, the system adds at least two items to the log each time an area is armed or disarmed, the open (or close) event and an event modifier showing the previous arming state.

All events and their modifiers can be stored even if the panel does not send a report for them. The log can be viewed at a command center, printed locally using the D9131A Parallel Printer Interface Module and a parallel printer, or uploaded to the Remote Account Manager (RAM IV).

See the appendix in the command center's *User's Guide* for a listing of log events and event modifiers.

2.4.8 EMI & Lightning Transient Protection

The D7212G Control/Communicator maintains the Bosch Security Systems high level of quality and field dependability. It's design significantly reduces electromagnetic interference and malfunction generally caused by lightning.

2.4.9 Programming

Use either the Bosch Security Systems D5200 Programmer or the Remote Account Manager (RAM IV) to program the D7212G Control/Communicator. Refer to the *D7212G Program Entry Guide* (P/N: 4998138538) for programming options.

2.4.10 Other Features

The D7212G Control/Communicator has many programmable features. A short list of some of the features follows. Complete details on all the features can be found in the *D7212G Program Entry Guide* (P/N: 4998138538).

- Supervision of AC (primary power), battery (secondary power), ZONEX and SDI buses, the CPU (Central Processing Unit), up to three printers, and two telephone lines
- Automatic system test reports
- Remote access for programming, diagnostics, and log uploads using the Remote Account Manager (RAM IV)
- Fire Alarm Verification
- Programmable Alarm Output
- Programmable Relay Output using the D8129 OctoRelay Module
- Opening and Closing Windows
- Skeds (scheduled events)

2.4.11 Control/Communicator Assembly

The D7212G Control/Communicator is shipped pre-assembled from the factory with the following parts:

- Literature Pack
  - *D7212G Approved Applications Compliance Guide* (P/N: 4998138560)
  - *D7212G Operation and Installation Guide* (P/N: 4998138544)
  - *D7212G Program Entry Guide* (P/N: 4998138538)
  - *D7212G Program Record Sheet* (P/N: 4998138542)
  - *D7212G Release Notes* (P/N: 4998138543)
  - *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide* (P/N: 43700)
  - *9000/9000G Series Technogram: Smoke Detector Compatibility* (P/N: 33284)
  - *7000/9000 Series Point Chart Label* (P/N: 79-06660-000)
- Assembly
  - PC Board
  - Faceplate Shield
  - Mounting Skirt
  - One #6 x1/4 in. Screw

2.4.12 Components and Literature Available by Separate Order

Order the following *components* separately to complete a basic 8 point installation:

- D1255, D1256, D1257, D1260, or D720 Command Center (or keyswitch)
- D1640 Transformer
- D126 or D1218 Battery
- D161 or D162 Phone Cord
- D8103, D8108A, or D8109 Enclosure

Configured packages are also available. Please consult the *Bosch Security Systems Intrusion Catalog*.

Overview

The following *literature* is available in a separate literature package for dealers:

- *D7212G Approved Applications Compliance Guide* (P/N: 4998138560)
- *D7212G Operation and Installation Guide* (P/N: 4998138544)
- *D7212G Program Entry Guide* (P/N: 4998138538)
- *D7212G Program Record Sheet* (P/N: 4998138542)
- *D7212G Release Notes* (P/N: 4998138543)
- *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide* (P/N: 43700)
- *9000/9000G Series Technogram: Smoke Detector Compatibility* (P/N: 33284)
- *7000/9000 Series Point Chart Label* (P/N: 79-06660-000)

2.4.13 Listings and Approvals

The D7212G Literature Pack includes the *D7212G Approved Applications Compliance Guide* (P/N: 4998138560). Refer to this guide for additional guidelines for installing the control/communicator in UL and Fire specific applications.

Fire	
UL	Underwriters Laboratories lists the D7212G Control/Communicator as a Control Unit for Household Fire Warning.
CSFM	Approval by the California State Fire Marshall for Household Fire Warning is pending for the D7212G Control/Communicator.
Burglary	
UL	Underwriters Laboratories lists the D7212G Control/Communicator for: Central Station, Local, Police Connect, Bank Safe and Vault, Mercantile Safe and Vault, and Grade A Household systems, and Proprietary.
Department of Defense (DOD)	The D7212G Control Communicator has been granted approval for Department of Defense (DOD) installations in Sensitive Compartmented Information Facilities (SCIF).

Table 6: Listings

3.0 Installation

3.1 Before Beginning

This section contains a general installation procedure and provides references to other sections of the guide for detailed instructions.

Bosch Security Systems recommends a review of this guide and the *D7212G Program Entry Guide* (P/N: 4998138538) before beginning the installation to determine the hardware and wiring requirements for the features that will be used.

Have the following additional documents available when reading through this guide:

- *D7212G Program Record Sheet* (P/N: 4998138542)
- *Security System Owner's Manual* (P/N: 71-06633-000)
- *Command Center Installation Manual (D1255, D1256, D1257, D1260, or D720)*

Before beginning the installation, become familiar with the operation of the D5200 Programmer or the Remote Account Manager (RAM IV).

3.2 Enclosure Options

Mount the control/communicator assembly in any of the Bosch Security Systems enclosures listed below. Refer to the *D7212G Approved Applications Compliance Guide* (P/N: 4998138560) to determine if the application requires a specific enclosure.

- D8103 Universal Enclosure (tan)
- D8109 Fire Enclosure (red)
- D8108A Attack Resistant Enclosure (tan)

3.3 Beginning the Installation

1. Mount the enclosure in the desired location. Use all five mounting holes. See *Figure 2*.

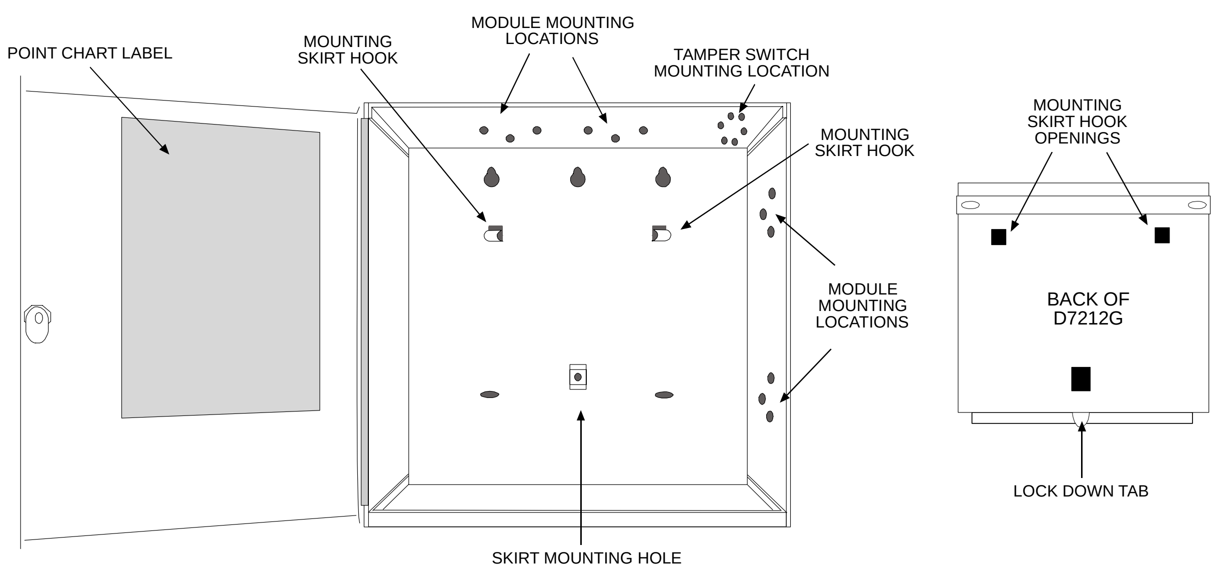


Figure 2: Enclosure Mounting

2. Run the necessary wiring throughout the premises, and pull the wires into the enclosure.

Note: *EMI (Electro Magnetic Interference) may cause problems. Refer to* EMI on Long Wire Runs in the D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide *(P/N: 43700).*

3.4 Installing the Assembly

1. Place the assembly over the inside back of the enclosure, aligning the large rectangular openings of the mounting skirt with the mounting hooks of the enclosure. Slide the assembly down so it hangs on the hooks. See *Figure 2* on page 21.
2. Remove the tape from the #6x1/4-in. screw in the mounting tab on the assembly. The screw passes through the mounting tab and into the skirt mounting hole in the enclosure. Tighten the screw to secure the assembly in the enclosure.
3. Connect earth ground to the panel before making any other connections. See *Section 3.5 Connecting Earth Ground.*

3.5 Connecting Earth Ground

3.5.1 Terminal 10

To help prevent damage from electrostatic charges or other transient electrical surges, connect the system to earth ground at Terminal 10 before making any other connections. A grounding rod or cold water pipe are recommended earth ground references.

CAUTION

Do not use telephone or electrical ground for the earth ground connection. Use 14-16 AWG wire when making the connection. Do not connect any other panel terminals to earth ground.

3.5.2 Ground Fault Detect Enable

GROUND FAULT is defined as "a circuit impedance to Earth Ground of approximately 95 kilohms or less." The panel will detect a ground fault on Terminals 1-9 and Terminals 11-32 if the Ground Fault Detect Enable jumper (S4) (see *Figure 3*) is locked (closed) and a non-zero value is entered in Area 5 Silent Alarm Relay (see the *D7212G Program Entry Guide* [P/N: 4998138538]). When the jumper is in the unlocked (open) position, the panel will not detect ground fault conditions. If a ground fault condition occurs, the command centers will display SERVC GND FAULT and the panel will transmit a TROUBLE REPORT GROUND FAULT AREA (Modem IIIa^2 format only). In order for the panel to detect a ground fault condition, the panel must see the ground fault for at least 30 consecutive seconds. When the panel recognizes that ground fault condition is corrected, a RESTORAL report is sent. For the restoral condition to be met, the ground fault must have been corrected for between 5 and 45 consecutive seconds.

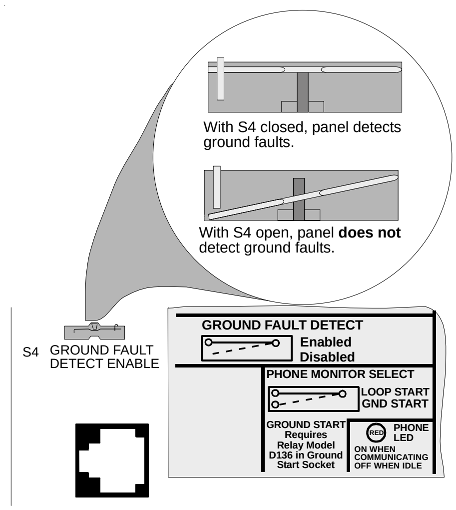


Figure 3: Ground Fault Detect

IMPORTANT

The D7212G Control/Communicator logs and prints a Ground Fault event as a Trouble Point 256 if communicating in Modem IIIa^2 format. If communicating in BFSK format, the D7212G Control/Communicator generates an Alarm Zone 5 event.

3.5.3 Locking the Reset Pin

Locking the Reset Pin disables the panel. See *Figure 4*. The system ignores the command centers and points while disabled. `CALL FOR SERVICE` appears in command center displays while the pin is locked down.

On-board relays (Terminals 6, 7, and 8) and off-board relays deactivate when the panel is reset. There is power at Terminal 8 when the relay is deactivated. Activation interrupts power at that terminal. The relays remain deactivated while the Reset Pin is locked in the disable position.

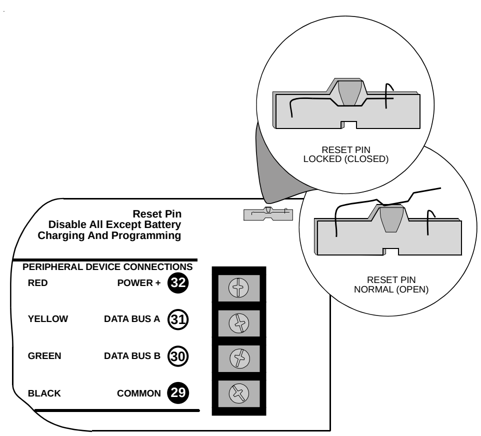


Figure 4: Reset Pin

Releasing the reset pin from the closed position resets the panel. The panel resets all its timers, counters, indexes, and buffers. Any points that restore after a reset is performed will not generate restoral reports.

If the reset pin is placed in the disable position when all areas are armed, there must be an entry in the *Answer Armed* program item. See *RAM Parameters* in the *D7212G Program Entry Guide* (P/N: 4998138538).

Locking the pin in the disable position allows powering up the panel and charging the battery while the detection devices and command centers are being installed.

3.6 Finishing the Installation

Earth ground and reset pin first: Make the earth ground connection to Terminal 10 and lock the reset pin in the closed position if not already done.

3.6.1 Charge the Battery While Finishing

Connect the battery and then the transformer so that the panel can charge the battery while the installation is being finished. See *Section 4.0 Power Supply*, on page 25 for instructions.

On-board Buzzer Sounds at Power Up and Reset: The system performs a series of self diagnostic tests of its hardware, software, and program at power up and at reset. The buzzer on the panel sounds during the tests. The self diagnostics take about 1-3 seconds to complete.

If the panel fails any of the tests, the buzzer continues sounding and a system trouble message appears at the command centers. See *Problems Found During Self Diagnostics* in the *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide* (P/N: 43700) for a description of each system trouble message.

Touch Terminal 10 first: If the on-board buzzer sounds briefly when the panel is touched, any static charge that may be carried is being discharged to the panel. The panel may generate `WATCHDOG RESET` and/or `PARAM FAIL` events. See the *Watchdog Reset Reports* section in the *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide* (P/N: 43700) for a description of these events. Always touch Terminal 10, the panel's earth ground connection, before beginning work on the panel.

3.6.2 Install and Wire Detection Devices

Install and wire detection devices and command centers at their locations throughout the premises. DO NOT make the connections at the panel end of the wiring yet.

Section 7.0 On-board Points on page 35 contains instructions for wiring the on-board points to detection devices. *Section 10.0 Arming Devices*, beginning on page 49, contains instructions for wiring the command centers.

Instructions for wiring the off-board point POPIT sensor loops are found in the instructions packaged with the POPIT Modules.

3.6.3 Install Modules and Relays

1. *Power Down First*: Power down the unit by unplugging the transformer and disconnecting the battery. Bosch Security Systems recommends powering down the unit when installing modules or relays, or when making wiring connections to the panel.
2. Install and wire any modules required for the installation as described in the module's installation instructions.

   Instructions for the D8125 POPEX Module, the D8128D OctoPOPIT Module, and the D8129 OctoRelay Module appear in this guide.

   See *Section 8.0 Off-board Points* on page 37 for D8125 and D8128D instructions. See *Section 9.0 Off-board Relays* on page 47 for D8129 instructions.
3. If using the power outputs at Terminals 7 or 8, install a D136 relay in the appropriate sockets. See *Section 5.4 Programmable Power Outputs Terminals* on page 29 for instructions.
4. If using a ground start phone system, insert a D136 relay in the ground start check socket and set the ground start pin in the ground start position. See *Section 6.11 Ground Start* on page 33 for more information.

3.6.4 Make the Telephone Connections

See *Section 6.0 Telephone Connections* on page 31. If connecting the panel to a ground start phone system, install a D136 relay, see *Section 3.6.3 Install Modules and Relays* on page 23.

3.6.5 Connect the On-board Points and Command Centers

Connect the on-board points and command center wiring to the system. See *Section 7.0 On-board Points* on page 35 and *Section 10.0 Arming Devices* on page 49 for instructions.

3.6.6 Power Up

Reconnect the battery, and then plug in the transformer. Remember - the buzzer sounds for two seconds when the panel is first powered up.

Leave the reset pin locked down for now.

Yellow Charging Status LED doesn't go out: If the yellow charging status LED doesn't go out within five minutes of powering up the panel, the battery may be deeply discharged, or too many powered devices have been connected to the panel. Combined continuous current draw for Terminals 3, 8, and 32 cannot exceed 1.4 A. See *Section 5.0 Power Outputs* on page 29 for help.

3.7 Programming the Panel

If a program hasn't been created for the panel, review the *D7212G Program Entry Guide* (P/N: 4998138538). Check to be certain all the required accessory modules to be installed for desired features are available. The reset pin must be in the locked position to copy or send information to and from the panel.

Use the D5200 Programmer or the Remote Account Manager (RAM IV) to load a custom program into the panel.

Move the reset pin to the normal position. See *Figure 4* on page 22. The panel transmits reboot and battery reports to the receiver if programmed for reporting.

3.8 Install the Point Chart Label

Bosch Security Systems recommends the *7000/9000 Series Point Chart Label* (P/N: 79-06660-000) provided in the literature pack be filled out and installed on the inside of the enclosure door for all systems.

Point chart label required for fire systems with verification points: The point chart label must be installed for fire or combined fire/burglary systems using verification points.

Use the *D7212G Program Record Sheet* (P/N: 4998138542) to gather the information needed to fill out the point chart. Install the label on the enclosure door as shown in *Figure 2* on page 21. To avoid smearing the entries on the chart, use the label's peel off backing to press the label in place.

3.9 Testing the System

After finishing the installation and programming of the panel, make a complete functional test of the system. Test the panel and all devices for proper operation. Test after first programming the panel and after any subsequent programming session.

Service Walk Test: Use the service walk test at a panel wide command center to perform a complete test of the panel. The service walk test function is similar to the ordinary walk test function, with the additional ability to display points that are not properly programmed.

If a device is tested and the panel doesn't respond, there may be a problem with the device, the wiring, the POPIT ID setting, or the programming for the point. If the switches on a POPIT are set incorrectly, it may create both a missing and extra point conditions.

See the *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide* (P/N: 43700) for complete service walk test instructions.

Clear after test: To clear the event memory and report buffer, momentarily close the reset pin. Events stored in the panel's event log are not cleared.

4.0 Power Supply

4.1 Primary Power Terminals ①②

4.1.1 Primary (AC) Power Circuit

A 16.5 VAC, 40 VA internally fused transformer (Bosch Security Systems D1640) is the primary power source. The AC power circuit provides 1.9 A of rectified AC power. The panel reserves 500 mA of this power for internal operations leaving 1.4 A for powered devices.

Transient suppressors and spark gaps protect the circuit from power surges. This protection relies on the ground connection at Terminal 10. Make sure to connect Terminal 10 to a proper ground. See *Section 3.5 Connecting Earth Ground* on page 22.

AC Power Failure

The system indicates an AC power failure when the power at Terminals 1 and 2 is missing. The *AC Fail Time* program item sets the number of minutes or seconds that AC must be missing before the panel acknowledges the failure and the number of minutes or seconds after the power returns before the panel acknowledges the restoral of power. See the *D7212G Program Entry Guide* (P/N: 4998138538) for additional information regarding *AC Fail Time*.

4.1.2 Installing the Transformer

Do not short the terminals of the transformer: Shorting the terminals opens the internal fuse causing permanent failure. Connect the transformer to Terminals 1 and 2 of the panel before plugging it into the power source.

Use 18 AWG (minimum) wire to connect the transformer to the panel. Wire length should be kept as short as possible. Maximum length is 50 ft. (15 m).

AC wiring can induce both noise and low level voltage into adjacent wiring. Route phone and sensor loop wiring away from any AC conductors, including the transformer wire. Route data wiring away from AC and phone wiring.

Connect the battery and then plug in the transformer: Bosch Security Systems recommends that the battery always be connected first and then the transformer be plugged in. See *Section 4.2.2 Installing the Battery* on page 26.

Only plug the transformer into an unswitched, 120 VAC, 60 Hz power outlet. Secure the transformer to the outlet with the screw provided.

D8004 Transformer Enclosure required for fire systems: Use the D8004 Transformer Enclosure for the D1640 transformer in fire and combined fire/burglary applications. Check with the Authority Having Jurisdiction (AHJ) on mounting transformers on specific circuits.

4.2 Secondary Power Terminals ❹⑤

4.2.1 Secondary (DC) Power

A 12 V, 7 Ah (up to 14 Ah) sealed lead-acid rechargeable battery (D126) supplies secondary power for auxiliary and alarm outputs, and powers the system during interruptions in primary (AC) power.

Lead Acid Batteries ONLY: The charging circuit is calibrated for lead-acid batteries. Do not use gel-cell or nicad batteries.

Extra Batteries Increase Back-up Time: To increase battery back-up time, connect a second 12 V, 7 Ah battery in parallel to the first battery to form a 12 V, 14 Ah battery. Use a D122 Dual Battery Harness to ensure proper and safe connection.

D1218 Battery

The D1218 is a 12 V, 17.2 or 18 Ah battery and can be used in applications requiring extended battery standby time. Up to two D1218 batteries may be connected when used with a D122 Dual Battery Harness. Do not use any additional batteries when using a D1218 battery.

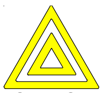
Power Supply

4.2.2 Installing the Battery

Place the battery upright in the base of the enclosure. Locate the red and black leads supplied in the literature pack. Connect the black battery lead to Terminal 4, and then to the negative (-) side of the battery. Connect the red battery lead to Terminal 5, and then to the positive (+) side of the battery.



High Current Arcs Possible : The positive (red) battery lead and Terminal 5 can create high current arcs if shorted to other terminals or the enclosure. Use caution when working with the positive lead and Terminal 5. Always disconnect the positive (red) lead from the battery before removing it from Terminal 5.



The Battery Terminals and Wires are NOT Power Limited. A ¼ in. (6.4 mm) spacing must be maintained between the battery terminals, battery wiring and all other wiring. Battery wiring may not share the same conduit, conduit fittings or conduit knock-outs with other wiring. See Figure 5.

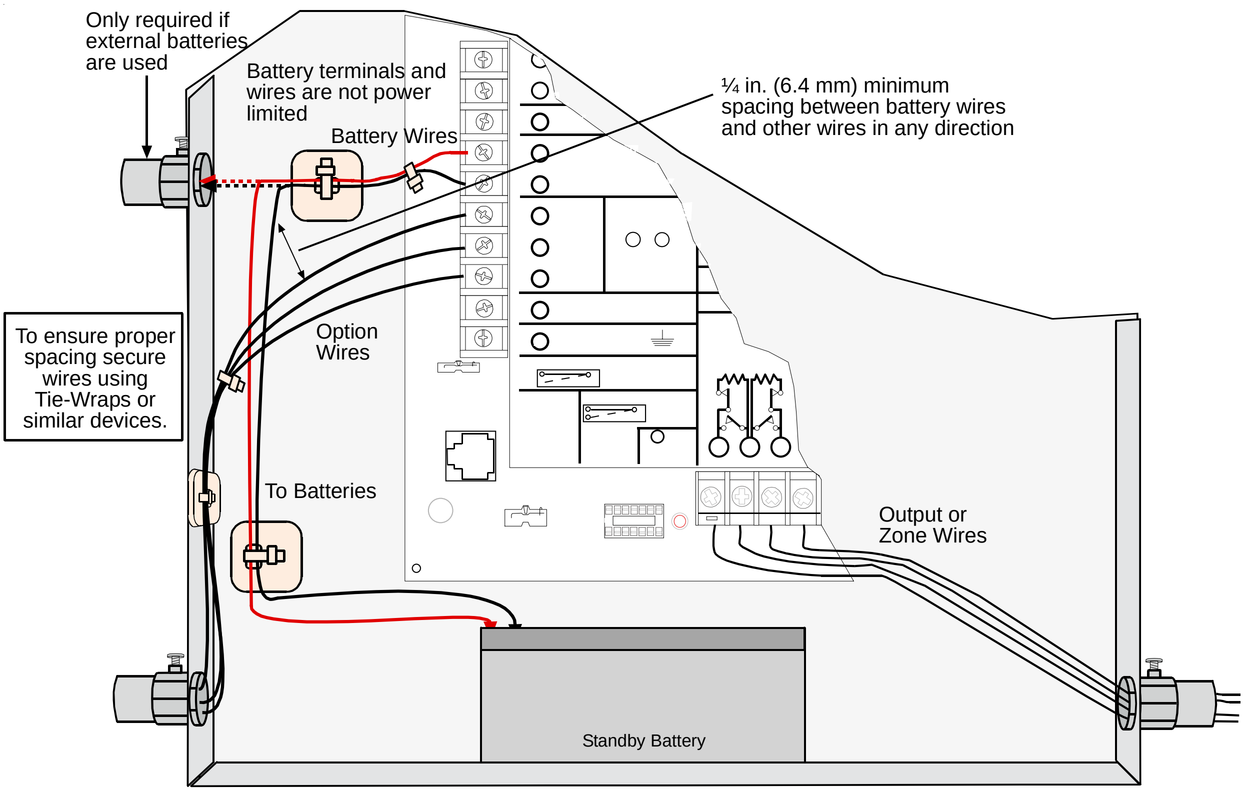


Figure 5: Non Power Limited Wiring

4.2.3 Replacing the Battery

Bosch Security Systems recommends battery replacement every 3 to 5 years under normal use. Exceeding the maximum output ratings, or installing the transformer in an outlet that is routinely switched off, causes heavy discharges. Routine heavy discharges can lead to premature battery failure. Record the date of installation directly on the battery.

D8132 boosts battery backup: Adding a D8132 Battery Charger Module supports additional batteries of up to 27 Ah capacity if required.

The D8132 Battery Charger Module can be used to connect two additional batteries for a total of four. The panel plus any connected D8132 Modules and AUX power supplies must be on the same AC circuit so they will discharge evenly if AC power fails. The number of D8132 Modules is determined by the number of available outlets on the same circuit. See *Section 4.1 Current Rating Chart for Standby Battery Calculations* in the *D7212G Approved Applications Compliance Guide* (P/N: 4998138560) for battery standby time calculations.

Note: In applications where the supervision of two batteries is required by the AHJ, a D113 Battery Supervision Module must be used.

4.2.4 Battery Supervision

When the battery voltage drops to 13.8 VDC, the yellow Charging Status LED lights. When the battery drops to 12.1 VDC, the red Low Battery LED lights and the panel, if programmed for power supervision, transmits a BATTERY LOW report in the Bosch Security Systems Modem IIIa² Communication Format. It transmits a TROUBLE ZN 9 report in the BFSK format.

If the battery is missing or shorted, the red Low Battery LED flashes at the same rate as the green Operation Monitor LED. If the panel is programmed for power supervision, it transmits a BATTERY MISSING report in the Bosch Security Systems Modem IIIa² Communication Format, or TROUBLE ZN 9 report in the BFSK format.

When battery voltage returns to 13.7 VDC the Low Battery LED goes out. If the panel is programmed for power supervision, it transmits a BATTERY RESTORAL report in the Bosch Security Systems Modem IIIa² Communication Format or RESTORAL ZN 9 report in the BFSK format. At 13.9 VDC the Charging Status LED goes out.

Investigate low battery reports immediately: If primary (AC) power is off and the discharge continues, the panel becomes inoperative when the battery voltage drops below 10.2 VDC.

4.2.5 Battery Charging Circuit

Float Charge

The float voltage for the battery charging circuit is 13.5 to 13.9 VDC at a maximum current of 1.4 A. If float voltage drops lower than 13.5 VDC, the Charging Status LED will illuminate.

Loss of AC Load Shed Relay protects battery: During an AC power loss the battery supplies all power to the security system. If the battery voltage falls below 10.2 V during an AC power loss, a “load shed” relay isolates the battery from the panel and disables the panel. Load shed protects the battery from being damaged by deep discharge. When AC power restores, the load shed relay resets and battery voltage is again available.

Overcharge Load Shed With AC Present: If more than 1.4 A of current draw from the panel is detected, the panel shuts down. Remove all loads to the panel and disconnect AC power. Add a new battery and reconnect AC power.

Reset the panel by momentarily placing the reset pin in the disable position. See *Figure 4* on page 22. The red Low Battery LED continues to flash until the panel is reset.

A shorted battery condition is created either by a shorted cell inside the battery or by a short on Terminals 4 and 5. A shorted battery may generate WATCHDOG RESET reports.

4.2.6 Battery Discharge/Recharge Schedule

Discharge Cycle	
AC OFF	AC fail report when AC fails if panel is programmed to report AC failure at occurrence.
13.9 VDC	Charging float level.
13.8 VDC	Charging Status LED on.
12.1 VDC	Low Battery & AC fail reports if programmed; Low Battery LED on.
10.2 VDC	Battery load shed (processing functions continue if AC is present).

Discharge Cycle	
AC ON	Load shed relay resets, battery charging begins, battery trouble and AC restoral reports sent.
13.7 VDC	Battery restoral reports sent, Low Battery LED off.
13.9 VDC	Charging Status LED off, battery float charged.

Table 7: Battery Discharge/Recharge Schedule

4.3 Charging Status and Low Battery LEDs

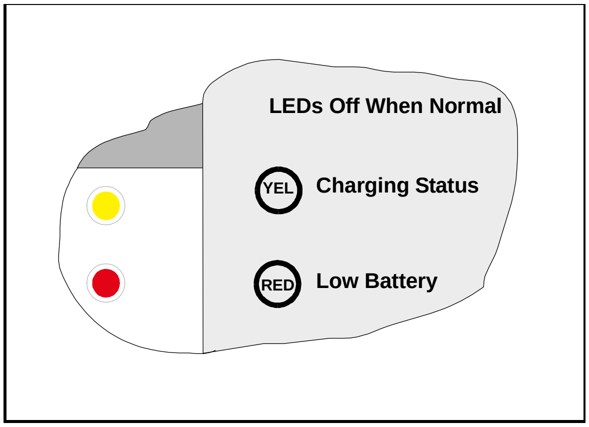


Figure 6: Charging and Battery LEDs

Type	LED Color	LED State	Action
Charging Status LED	Yellow		Shows the charging status of the battery. *Figure 6* on page 27 shows its location.
	Yellow	Off	Battery is fully charged. *If the battery is missing, shorted, or reversed: The Charging Status LED is off, but the red Low Battery LED is flashing.*
	Yellow	On	Battery float charge is below 13.8 VDC. If AC is present, the battery is charging. When the combined current draw from all outputs exceeds 1.4 A. This is normal under alarm conditions for non-fire systems with sirens or bells draw more than 1.4 A. If the LED comes on regularly for extended periods or doesn't go out, check the current draw for devices connected to the power outputs. See *Section 5.0 Power Outputs* on page 29 for instructions.
	Yellow	Flash once/min	System is checking the battery.
	Yellow and Red	Flash once/min	When the current draw for devices connected to the power outputs exceeds 1.4 A and/or the battery is missing.
Low Battery LED	Red		Shows the condition of the battery. *Figure 6* on page 28 shows its location.
	Red	Off	When the battery is fully charged.
	Red	On	Battery voltage as fallen below 12.1 VDC. LED goes out when voltage reaches 13.7 VDC.
	Red	Flash (same rate as Green LED)	Green LED is Operation Monitor LED. Battery is missing or shorted.
	Red and Yellow	Flash once/min	When current draw for devices connected to the power outputs exceeds 1.4 A and/or the battery is missing.

Table 8: Charging Status and Low Battery LEDs

5.0 Power Outputs

5.1 Circuit Protection

Three Positive Temperature Coefficients (PTCs) protect the panel from short circuits on both the continuous and programmable power outputs. If the panel is programmed for power supervision and short is sustained on one of the power outputs, the panel transmits a `BATTERY LOW` or `BATTERY MISSING` for Bosch Security Systems Modem IIIa[2] Communication Format, or `TROUBLE ZN 9` for BFSK.

- One PTC protects Terminal 3: Auxiliary Power
- One PTC protects Terminal 6: Alarm Power Output, Terminal 7: Alternate Alarm Power Output, and Terminal 8: Switched Auxiliary Power. A short on one of these terminals disrupts the power to the other two.
- One PTC protects Terminal 32: Power +.

5.2 Total Available Power

The system produces up to 1.4 A of combined power at 10.2 VDC to 13.9 VDC for all powered devices. The outputs listed below share the available power. These outputs are shown as red circles on the face plate.

Terminal 3 - Auxiliary Power. Use this terminal to power devices requiring continuous power.

Terminal 6 (Relay A) - Alarm Power Output. Normally open, power on alarm.

Terminal 7 (Relay B) - Alternate Alarm Power Output. Normally open, power on alarm.

Terminal 8 (Relay C) - Switched Auxiliary Power. Normally open, power off on reset.

Terminal 32 - Power +
Use this terminal to power SDI (Serial Device Interface) devices such as command centers and the D9131A Parallel Printer Interface Module.

5.3 Aux Power Terminals (3)(8)(32)

5.3.1 Continuous Current Draw

The continuous current draw for powered devices connected to Terminals 3, 8, and 32 must not exceed 1.4 A. Devices powered from these outputs must operate over a range of 10.2 VDC to 13.9 VDC.

Power restricted for fire and combined fire/burglary systems: Use the *Fire System Power Formula* to calculate the current available for fire and combined fire/burglary system (see *Section 5.4 Programmable Power Outputs Terminals*).

5.4 Programmable Power Outputs Terminals (6)(7)(8)

5.4.1 Programming

The power outputs at Terminals 6, 7, and 8 are programmed as Relays A, B, and C. All relays are programmed in the *Relays* section of the program. Relays are assigned a relay type, Fire Bell for example, when they are assigned to an area. Relays can be assigned to one or more areas.

The Bosch Security Systems defaults set Relay A (Terminal 6) as a Steady Alarm Bell output and Relay B (Terminal 7) as a Pulsed Fire Bell output, and Relay C (Terminal 8) as a Verification/Reset output for smoke detectors. The *D7212G Program Entry Guide* (P/N: 4998138538) contains complete instructions for programming relays. Descriptions of the functional characteristics of each terminal appear on pages 30 through 31.

See the *Bell Parameters* section of the program to set the Fire Bell, Alarm Bell output responses for relays. Four annunciation patterns: Steady, Pulsed, California Standard, and Temporal Code 3 are available.

Voltage Output at Terminals 6, 7 and 8: If Terminals 6, 7, and 8 don't provide the expected output:

- Check the programming for Relays A, B, and C in the *Relays* section of the program.
- Check the *Bell Parameters* section of the program to verify the Alarm and Fire Bell responses are programmed for the expected duration and pattern.
- Check the *Point Assignments* to verify each point is programmed for the expected local response.

Power Outputs

5.4.2 Optional Relays Required

Install an optional D136 Plug-in Relay into the ALT ALARM socket to enable the output at Terminal 7. Install a D136 in the SW AUX socket to enable the output at Terminal 8. The relay sockets are under the faceplate as shown in *Figure 7*.

Relay Installation

Power down the system before inserting the D136 relays. The plug-in relays are shorter than the sockets they plug into. See *Figure 7*. They can be installed in either the left or right end of the socket.

Don't rely on relay labelling:
Don't rely on the labeling to install D136 relays. Check for the side with three pins. The three pins go on the top side of the socket.

Incorrect insertion does not damage the relay or the system, however the related circuits do not function properly.

5.4.3 Terminals 6 and 7

Terminals 6 (Relay A) and 7 (Relay B), provide positive (+) 10.2 VDC to 13.9 VDC power output when activated. Use the power at Terminals 6 and 7 to power bells, siren drivers, piezo fire sounders, electronic horns, or other devices. Programming determines the format of the output and the conditions that activate it. One PTC protects Terminals 6, 7, and 8 against shorts.

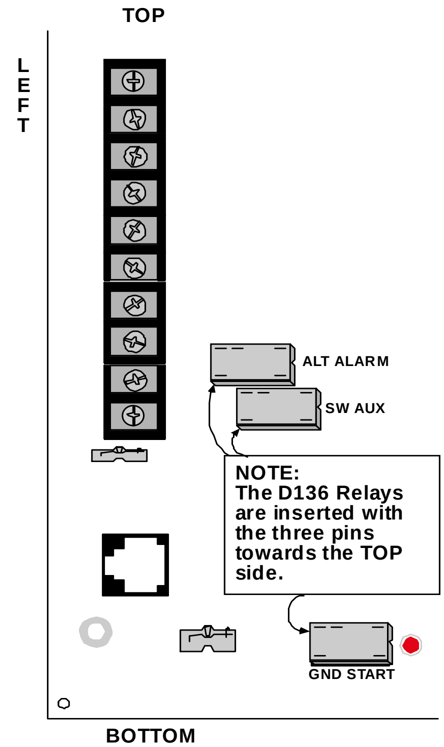


Figure 7: Relays for Terminals 7 and 8 and Ground Start

Available Power

The system combines the 1.4 A of primary power produced by the power supply with the secondary power source (the battery) to produce a total of 2.0 A of alarm power at 10.2 to 13.9 VDC. Terminals 6 and 7 share the available alarm power.

Power restricted for fire and combined fire/burglary systems: Fire systems are prohibited from using the battery for determining alarm power. Use the *Fire System Power Formula* below to calculate the current available for fire and combined fire/burglary systems.

5.4.4 Fire System Power Formula

To calculate the current available at Terminals 6 and 7 for fire and combined fire/burglary systems:

1. Add together the current draws for all devices connected to Terminals 3, 8, and 32. This total is the total current required for the Normal Standby Condition (NSC).
2. The current available for NSC is 1.4 A. Subtract the NSC current required calculated in step 1 from the NSC current available, 1.4 A. The difference is the Alarm Current available for Terminals 6 and 7.

In formula format:
1.4 A – NSC current required (step 1) = Alarm Current available

Refer to the *D7212G Approved Applications Compliance Guide* (P/N: 4998138560) for module/accessory current requirements.

5.4.5 Terminal 8

Terminal 8 provides continuous positive (+) 10.2 VDC to 13.9 VDC power. Relay C interrupts the power at Terminal 8 when activated. Use Terminal 8 to power smoke detectors or other devices that are reset by interrupting power.

One self-resetting circuit breaker protects Terminals 6, 7, and 8 against shorts.

Verification/Reset Relay

The default program sets Relay C (Terminal 8) as a verification/reset relay. See *Relay Parameters* and *Point Assignments* in the *D7212G Program Entry Guide* (P/N: 4998138538) for instructions on programming verification/reset relays and points.

Performing a Sensor Reset at a command center produces a five second relay activation of verification/reset relays. The panel ignores verification/reset points during the five seconds of relay activation.

6.0 Telephone Connections

6.1 Registration

The Bosch Security Systems D7212G Control/Communicator is registered with the Federal Communication Commission under Part 68, for connection to the public telephone system using an RJ31X or RJ38X jack installed by the local phone company.

Note: An RJ31X jack can be modified by placing a jumper wire between Terminals 2 and 7 to become an RJ38X jack.

6.2 Notification

Do not connect registered equipment to party lines or coin-operated telephones. The local telephone company must be notified and supplied with the following information before connecting the panel to the telephone network:

- The particular line to which the panel will be connected
- Make (Bosch Security Systems), model (D7212G), and serial number of the panel
- FCC registration number and ringer equivalence for the panel:
  - FCC Registration Number: AJ9MUL-46532-AL-E
  - Ringer Equivalence: 0.1B

6.3 Location

To prevent jamming of signals, wire the RJ31X or RJ38X jack before the in-house phone system to support line seizure. See *Figure 8*. Install the jack on the street side of the phone switch, wired ahead of any PBX equipment. Line seizure provides for a temporary interruption of normal phone usage while the communicator transmits data. After installation, confirm that the panel seizes the line, acquires dial tone, reports correctly to the receiver, and releases the phone line to the in-house phone system.

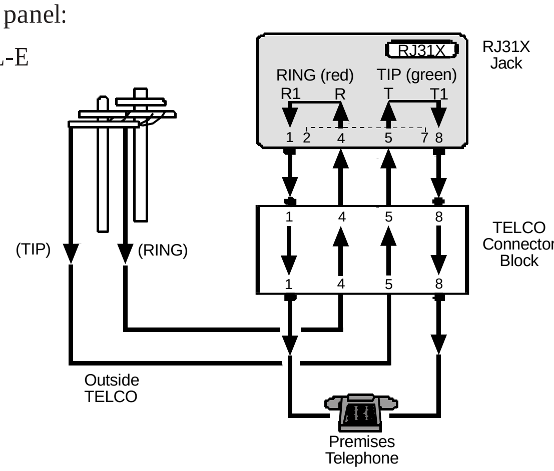


Figure 8: RJ31X Wiring

6.4 Phone Cord Connection

Connect one end of a D161 (7 ft. [2.1 m]) or D162 (2 ft. [61 cm]) Telephone Cord to the TELCO Cord connector located on the bottom left corner of the panel. See *Figure 9*. Connect the other end to the RJ31X or RJ38X jack.

Note: To supervise the phone cord, use an RJ38X jack.

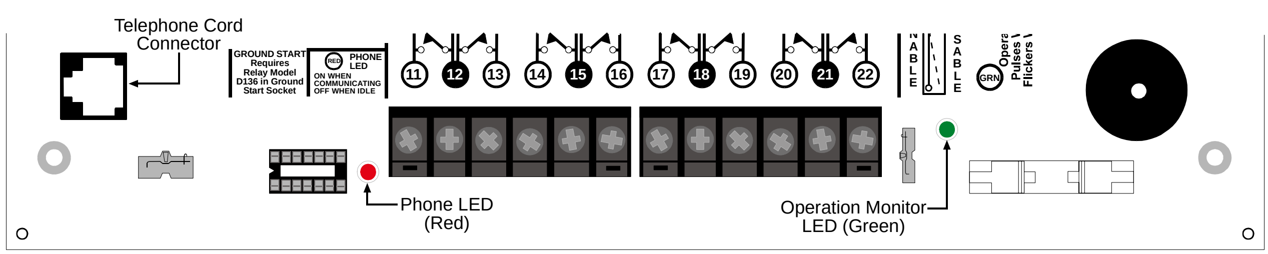


Figure 9: Phone Connector and LED and Operation Monitor LED Locations

6.5 Phone LED (Red)

The red Phone LED lights when the panel seizes the phone line and remains lit until the panel returns the phone line. See *Figure 9* for the location of the red LED.

6.6 Operation Monitor LED (Green)

The green Operation Monitor LED indicates the operation of the CPU (Central Processing Unit). When the CPU is operating normally, the LED flashes 0.5 sec. on, 0.5 sec. off.

The green LED also serves as a ring indicator. The LED is located on the lower right side (see *Figure 9* on page 31). When there is ring voltage on the phone line (the phone is ringing), the green LED flickers at a faster rate for the duration of each ring. Ring voltage must reach a minimum of 45 VAC before the system detects it.

6.7 Dialing Format

The system can be programmed to use DTMF or pulse dialing. See *Phone Parameters* in the *D7212G Program Entry Guide* (P/N: 4998138538).

6.8 Phone Line Monitor

The panel has a built-in phone line monitor that tests the phone line for voltage. The normal voltage on a telephone line is approximately 48 VDC (24 VDC for some phone systems). The phone line monitor senses trouble when the voltage on the line falls below 3.0 VDC.

If the monitor senses trouble, it starts a programmable phone line trouble timer. The timer continues to run as long as the monitor senses trouble. It resets to zero when the panel senses a normal line. If the timer reaches the delay time in the *Phone Supervision* program item, it begins a phone line trouble response. Programming determines what the response is. See *Phone Parameters* in the *D7212G Program Entry Guide* (P/N: 4998138538).

Anytime the D7212G uses the phone line to make a call(s) or is on-line with RAM IV, it ceases to monitor the phone line during this process. Once the phone line on the D7212G is no longer in use, it begins once again to monitor the phone line.

Bad line may test OK: The telephone line monitor uses voltage levels to test the status of the phone line. In some instances a given telephone line may be out of service without affecting the voltage on the line. The phone line monitor can not recognize this trouble condition.

6.9 Called Party Disconnect

Telephone companies provide "called party disconnect" to allow the called party to terminate a call. The called party must go on hook (hang up) for a fixed interval before a dial tone is available for a new call. This interval varies with telephone company equipment. D7212G firmware allows for "called party disconnect" by adding a 35 second "on hook" interval to the dial tone detect function. If the panel does not detect a dial tone in seven seconds, it puts the phone line on hook for 35 seconds to activate "called party disconnect," goes off hook and begins a seven-second dial tone detect. If no dial tone is detected, the panel dials the number anyway. Each time the number is dialed, the panel records this as an attempt.

6.10 Communication Failure

After two attempts to reach the receiver, a `COMM FAIL PH #` event is generated. This event (`COMM FAIL PH #`) will then be sent first, followed by the original event.

After ten attempts to reach the receiver, the panel goes into communication failure. The panel clears any reports in its phone buffer and `COMM FAIL RTE #` event is generated, which appears in the display at command centers. A trouble sounder can be programmed to annunciate at the command centers. An hour after the `COMM FAIL RTE #` is generated, the panel attempts to send this event (`COMM FAIL RTE #`), if programmed. If the `COMM FAIL RTE #` event is the only event in the queue and is unable to reach the central station, the command centers will not turn on the trouble sounder again.

6.10.1 Enhanced Communication

The D7212G Control/Communicator has the ability to transmit events over the SDI Bus to a D9133TTL-E Network Interface Module. For more information on Enhanced Communications capabilities, please refer to *RADXAUX1* in the *D7212G Program Entry Guide* (P/N: 4998138538).

6.11 Ground Start

Some telephone systems require a momentary ground input to initiate dial tone. To interface with a ground start system, insert a D136 Plug-in Relay into the GND START socket and set the Phone Monitor Select jumper to the GND START position.

WARNING *Ground start is not for use in NFPA applications. You cannot use ground start telephone systems for NFPA Central Station Protective Signaling or Remote Station applications.*

Note: Terminal 10 must be connected to an earth ground in order for ground start phone systems to operate properly on the D7212G.

6.11.1 Relay Installation

Power down the system before inserting the D136 relay into the GND START socket. The relay socket is in the lower left corner as shown in *Figure 7* on page 30. The plug-in relay is shorter than the socket it plugs into. It can be installed in either the left or right end of the socket.

Don't rely on relay labeling: Don't rely on the labelling to install D136 relays. Check for the side with three pins. The three pins go on the top side on the socket.

Incorrect insertion does not damage the relay or the panel, however the related circuits do not function properly. A ground start relay must not be inserted if the ground start jumper is in the loop start position (see *Figure 10*).

6.11.2 Phone Monitor Select Jumper

The Phone Monitor Select jumper is above the TELCO connector point at the lower left corner of the panel. Set it in the ground start position. See *Figure 10*.

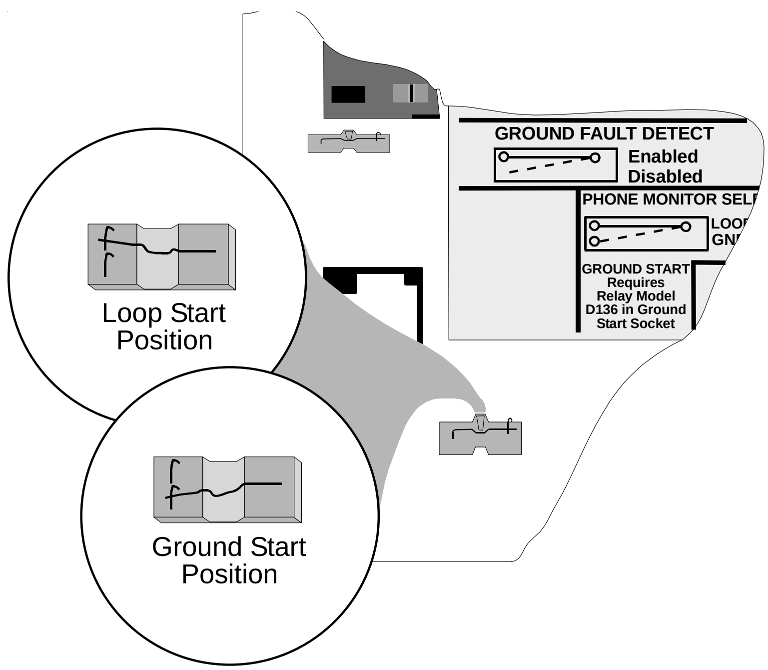


Figure 10: Phone Monitor Select

Notes:

7.0 On-board Points

7.1 Description Terminals ⑪ to ㉒

The panel provides eight on-board points. Each point functions independently and does not interfere with the operation of the others. The panel monitors the sensor loops for normal, shorted, or open conditions between an input terminal (11, 13, 14, 16, 17, 19, 20, or 22) and any of the point common terminals (12, 15, 18, and 21). Programming for the point determines how the panel responds to those conditions. See the *D7212G Program Entry Guide* (P/N: 4998138538) for point programming options. The panel also monitors the sensor loops for ground fault conditions if S4 is latched (ground fault detect enabled).

7.2 Point Sensor Loops

When wiring the on-board points (see *Figure 11*), install a 1 kΩ resistor at the far end of the sensor loop to provide a reference for supervision. Dry-contact sensing devices can be connected in series (normally-closed) and/or in parallel (normally-open) to any of these loops.

The number of normally-open and/or normally-closed detection devices each sensor loop can supervise is limited only by the resistance on the loop. The total resistance for wire length and contacts, minus the end-of-line resistor, must not exceed 100 Ω.

7.3 Point Parameters

The condition of on-board points 1 to 8 can be determined by measuring the voltage across the point input terminal and one of the common terminals. The sensor loops must be connected and the 1 kΩ end-of-line resistor in place.

Open Loop = Greater than 3.7 VDC, but less than 5.0 VDC.

Normal Loop = Greater than 2.0 VDC, but less than 3.0 VDC.

Shorted Loop = Greater than 0.0 VDC, but less than 1.3 VDC.

7.4 Point Response Time

The panel scans both on-board and off-board point sensor loops every 300 milliseconds. The *Debounce Count* program item in the *Point Assignment* section of the *D7212G Program Entry Guide* (P/N: 4998138538) determines point response time by setting the number of scans that a point must be faulted before the panel initiates an alarm.

The debounce count can range from 2 to 15. Therefore point response time ranges from 600 ms to 4.5 sec. The Bosch Security Systems default for Debounce Count is 2.

WARNING

Increasing debounce may cause missed alarms: If you increase the Debounce Count, detection devices may go into alarm and reset without exceeding the point response time.

Bosch Security Systems recommends a debounce count of 2 for all points except for *Interior Follower* points, which should be programmed as a 3.

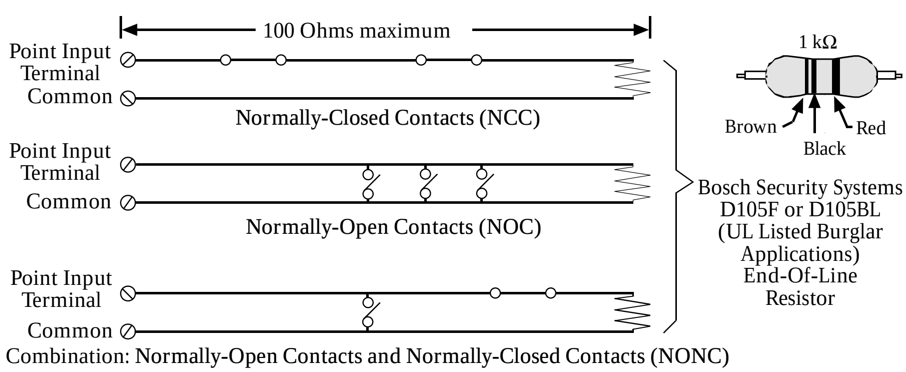


Figure 11: On-board Point Sensor Loop Wiring

7.5 Wiring Information for Installations using the Ademco AB-12 Bell/Housing

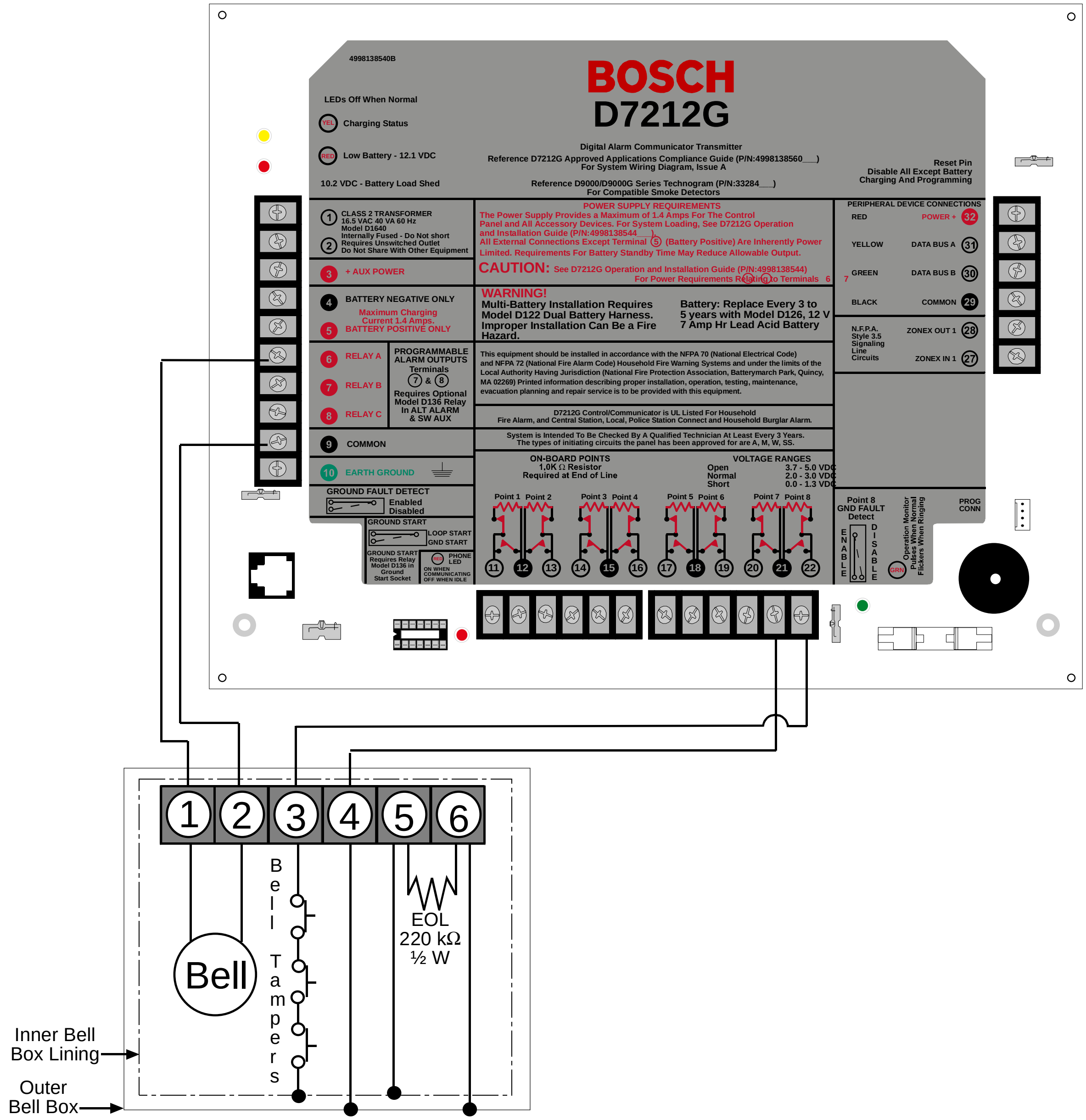


Figure 12: Wiring for Installations using the Ademco AB-12 Bell/Housing

1. Disconnect the wire jumper from Terminal 4 to the inner housing of the Bell Box (prevents a ground fault condition).
2. Connect wiring between the control and Bell Box as shown above. To use the AB-12 Bell/Housing, place the S3 switch in the disabled (open) position. The EOL used in the AB-12 Bell/Housing must be a 220 kΩ, 0.5 Ω resistor.
3. Program Point 8 as 24-hour, ALARM on open and short. (PT TYPE 0, PT RESPONSE 0).

8.0 Off-board Points

8.1 Point (ZONEX) Bus D7212G Terminals (27) to (28)

The D7212G can use POPIT (Point of Protection Input Transponder) Modules to provide up to 32 off-board points, bringing the total number of points the D7212G can monitor to 40.

POPITs connect to supervised two-wire data expansion loops run from POPIT to POPIT throughout the premises. Data expansion loops connect to a D8125 POPEX (Point of Protection Expander) Module. POPEX Modules connect to the point bus on the panel, Terminals 3 and 9 for powerand Terminals 27 and 28 for data.

If a programmed POPIT is disconnected from the expansion loop, a missing condition appears immediately and the event is logged. The missing condition may also be transmitted to a central station or printed to an on-site printer, if programmed to do so. See the *D7212G Program Entry Guide* (P/N: 4998138538) for programming options.

Extra Point events are generated when a POPIT is connected to the data expansion bus but does not have a Point Index assigned to it. Shown below are instances when an EXTRA POINT event will or will not be generated.

If a POPIT is connected to the data expansion bus but does not have a Point Index assigned to it and…

- the data expansion bus becomes disconnected, no trouble condition is annunciated or displayed at command centers and the EXTRA POINT event will not be generated. (However, POPIT's that are programmed with a Point Index will immediately go missing.)
- the data expansion bus restores to a normal condition from an open, a trouble condition will annunciate and display at the command center. In addition, an EXTRA POINT event is generated, logged, and may be programmed to be sent to the central station or printed to an on-site printer.
- the point input goes from an electrically normal state to an open or shorted state, the command center will neither annunciate nor display a trouble condition. No EXTRA POINT event will be generated.
- the system is presently in a Service Walk Test and the point input goes from an electrically normal state to an open or shorted state, the command center will neither annunciate nor display a trouble condition. However, an EXTRA POINT event will be logged and printed to an on-site printer, if programmed. Note: The Service Walk Test will never display a points' electrical state as 'Extra'.

If the positive or negative leg of the data expansion bus is shorted to earth ground and Ground Fault Detect is enabled, a general GROUND FAULT event is generated.

If the positive or negative leg of the data expansion bus becomes disconnected then all POPIT's beyond the break will report as a missing condition.

If the data expansion bus becomes shorted then all POPIT's will report a missing condition and a PT BUS TROUBLE event is generated. When the data expansion bus restores from a shorted condition, a PT BUS RESTORE event is generated and if there are POPIT's connected to the data expansion bus without a Point Index assigned to it, then an EXTRA POINT event will be generated.

If the positive or negative leg of the data expansion bus becomes shorted to a Common terminal on the D7212G then all POPIT's will report a missing condition. In addition to this, a PT BUS TROUBLE event will also be generated.

If Terminal 28 becomes shorted to a Common terminal, a PT BUS TROUBLE event will not be generated. However, a short between Terminal 27 and a Common terminal will generate a PT BUS TROUBLE event and the command center will display `SERVC ZONEX 1`. If Terminal 27 and Terminal 28 are shorted together, a PT BUS TROUBLE event is generated and the command center will display `SERVC ZONEX 1.`

The D7212G will respond to missing point conditions based on how the points are programmed and which armed state the area is in that the point is assigned to. For example, if an interior motion detector point went missing during a disarmed state, a MISSING TROUBLE event would be generated. However, if the point went missing while the area was Master Armed, a MISSING ALARM event would be generated. Non-fire 24-hour points always generate a MISSING ALARM event whereas Fire points always generate a MISSING FIRE trouble event.

8.2 D8125, D8127 and D9127 POPIT Modules

D8127 and D9127 POPITs use the D8125 POPEX Module to report to the panel. The D8125 supports up to 32 POPIT points (Points 9 to 20). The panel only annunciates activity for each POPIT, not each detection device connected to the sensor loop.

There are two versions of the D8127 and D9127 Modules. Both module enclosures are made of UL Listed fire resistant material. D8127T and D9127T Modules contain tamper switches. D8127U and D9127U Modules come with untampered covers. Unless the module is mounted in a tampered enclosure, UL requires D8127T and D9127T Modules for certificated accounts.

8.2.1 Listings

The D8125 POPEX and the D8127 and D9127 POPIT Modules are UL Listed for use with the D7212G for each of the categories listed in *Section 2.4.13 Listings and Approvals* on page 20. See the *D7212G Approved Applications Compliance Guide* (P/N: 4998138560) to determine the required equipment and enclosures for the application.

8.3 Installing the D8125 POPEX Module

IMPORTANT

For information on the Multiplex Bus Interface, see the D8125MUX Operation and Installation Guide *(P/N: 36796).*

Save the POPIT Label Sheets: The D8125 is packaged with two sets of POPIT label sheets. One is marked for use with the D9412/D9112. Save this set for use with the D7212G. It will be used later to label the POPITs.

8.3.1 Mounting

Use the following procedure to install the D8125 in the enclosure with the panel:

1. Align the D8125 POPEX Module with any of the four mounting locations in the enclosure. See *Figure 2* on page 21.
2. Use the screws provided with the module to secure it in the enclosure.

8.3.2 Wiring the D8125 to the Control/Communicator

Follow the procedure below to wire one or two D8125 POPEX Modules to the panel. See *Figure 13* on page 39.

Power down first: Power down the panel by disconnecting the positive (red) battery lead at the battery and unplugging the transformer.

For Points 9 to 40:

1. Connect the GND terminal of the D8125 to Terminal 9 on the D7212G.
2. Connect the OUT terminal of the D8125 to ZONEX IN 1, Terminal 27.
3. Connect the IN terminal of the D8125 to ZONEX OUT 1, Terminal 28.
4. Connect the AUX terminal of the D8125 to Terminal 3 on the D7212G.

See *Section 8.3.4 Wiring Data Expansion Loops to POPEX Modules* on page 39 for instructions on connecting POPITs to the D8125 POPEX Module.

8.3.3 Wiring POPITs to the Data Expansion Loop

Use one 2-wire data expansion loop or distribute the POPITs on up to three loops. Setting DIP switches on the POPIT Modules assigns them to point numbers. See *Section 8.3.6 POPIT Module Point Assignments* on page 41.

Review *Section 3.6.2 Install and Wire Detection Devices* on page 23 to determine if shielded wire is required. Determine the required wire gauge for the length of each data expansion loop using *Table 9* on page 39.

Maximum Length of all Data Expansion Loops Combined	
AWG	Length in ft. (m)
22	1800 (548)
20	2890 (881)
18	4600 (1402)
16	7320 (2231)
14	11650 (3551)

Table 9: Data Expansion Loop Wire Specifications

Combine data expansion loops: The maximum lengths shown in *Table 9* are for all data expansion loops connected to the same POPEX Module combined.

IMPORTANT *Before installing the POPITs, make sure the resistance on the data expansion loop is no more than 40* ***Ω.***

Wiring POPITs together: *Do NOT connect POPITs to each other in series, or with a T-tap. Doing so may cause random missing POPIT conditions. Follow the procedure below to connect POPITs to one another in parallel.*

1. Connect the positive (+) Data terminal from one POPIT to the positive (+) Data terminal on the next POPIT.
2. Connect the negative (-) Data terminal from one POPIT to the negative (-) Data terminal on the next POPIT.
3. Repeat steps 1 and 2 to connect all POPITs to the expansion loop. The POPITs don't need to be wired in any particular order on the loop. The switch setting on each POPIT assigns it a point number, regardless of its physical location.

Clearance for tampered POPITs: Mount tampered POPIT Modules at least 3.0 in. (7.6 cm) apart to prevent the tamper magnets from interfering with each other.

8.3.4 Wiring Data Expansion Loops to POPEX Modules

There are two positive (+) and two negative (-) data expansion loop terminals on each POPEX Module. Follow the procedure below to connect the data expansion loops to the D8125 POPEX Module (see *Figure 13* on page 40). Remember, a maximum of 32 POPITs can be connected to one D8125 on the D7212G.

1. Connect the positive (+) Data terminal from the first POPIT on the data expansion loop to one of the D8125 Module's positive (+) terminals.
2. Connect the negative (-) Data terminal from the first POPIT on the data expansion loop to one of the D8125 Module's negative (-) terminals.

8.3.5 POPIT Sensor Loops

The number of normally-open and/or normally-closed detection devices each sensor loop can supervise is limited only by the resistance on the loop. Resistance on each sensor loop must be less than 100 Ω not including the EOL resistor.

Certain UL and NFPA applications may limit the number of detection devices. Consult the appropriate UL or NFPA standards.

POPITs detect open, shorted, normal, and grounded circuit conditions on their sensor loops. A ground on the sensor loop reports as a general system ground fault condition (see *Ground Fault* in the *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide* [P/N: 43700]). Each POPIT is programmed and transmits to the panel separately.

Terminate each POPIT sensor loop with the 33 kΩ end-of-line resistor [D106F] included with each POPIT.

Bosch Security Systems recommends the use of twisted-pair wire (six twists per foot) in all POPEX/POPIT installations for both the data expansion loop wiring and the POPIT sensor loops. Run wires away from AC sources to prevent AC induction. If a noisy environment is suspected, use shielded cable. See *Section 8.3 Installing the D8125 POPEX Module* on page 38.

Off-board Points

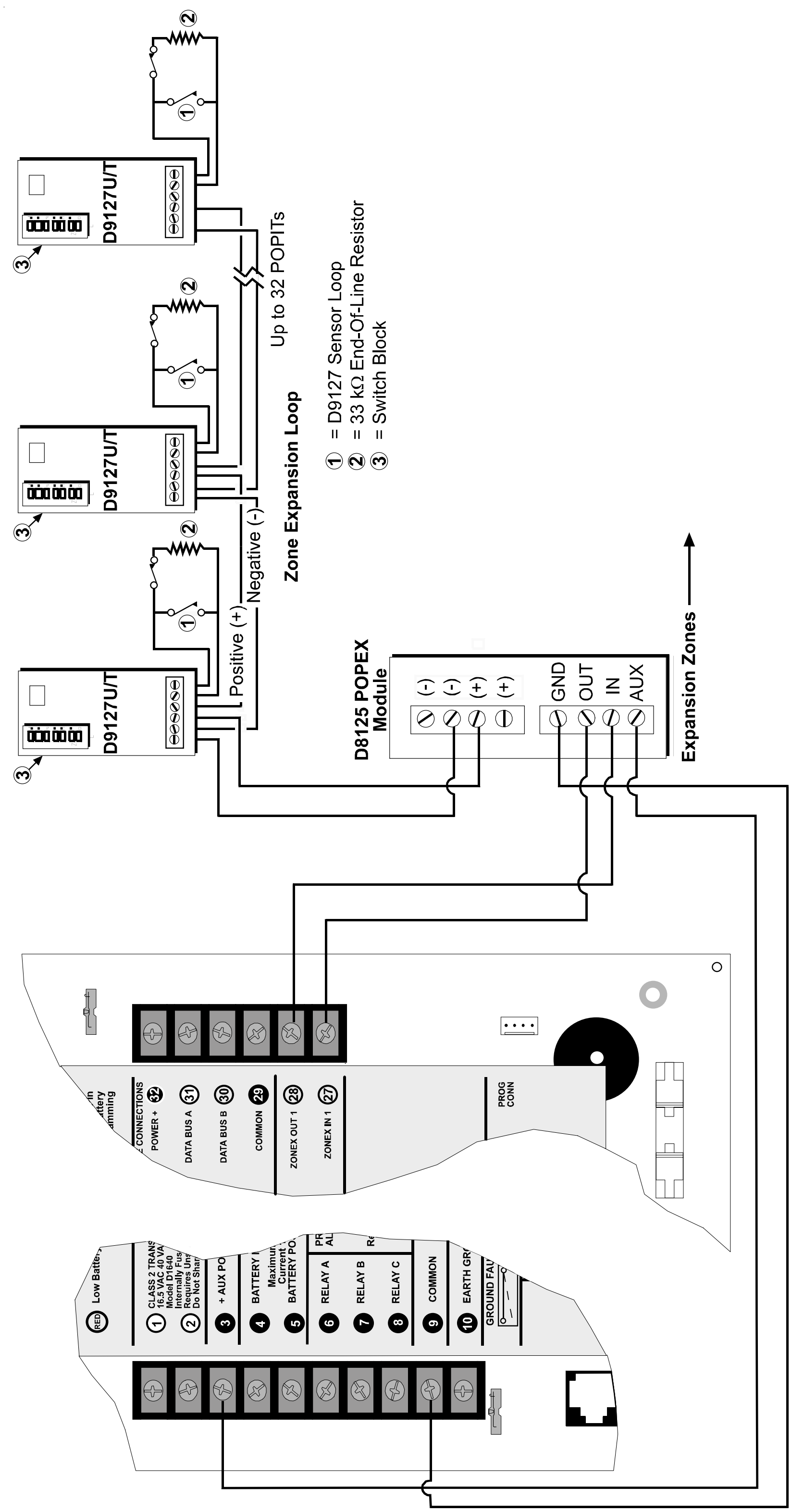


Figure 13: Connecting the D8125 POPEX to the D7212G Panel

8.3.6 POPIT Module Point Assignments

Seven switches on each D9127U/T POPIT (six on each D8127U/T POPIT) assign the module to a point number. POPIT switch settings are found in *Point Assignment* in the *D7212G Program Record Sheet* (P/N: 4998138542). See *Figure 14*.

8.3.7 Program Record Sheet

The eight columns on the *D7212G Program Record Sheet* (P/N: 4998138542) contain the following information:

- First column (POPIT Switch Settings): the switch settings for the D8127 POPITs. Switches are numbered 1 to 6, left to right on the D8127 POPIT. Switches are numbered 0 to 6, left to right on the D9127 POPIT. Set switches with numbers that appear in the setting to the ON position. Set switches with a dash (-) in the switch position to the OFF position. See *Figure 14*.
- Second column (Translation): the translation of the point number into the ZONEX format. See *Point User Flag* in the *D7212G Program Entry Guide* (P/N: 4998138538) for an explanation of this feature.
- Third column (Point #): the point number as it is displayed at command centers.
- Fourth column (Point Index): See *Point Index Parameters* in the *D7212G Program Entry Guide* (P/N: 4998138538) for an explanation of the point index.
- Fifth column (Area Assign): the area the point is assigned to.
- Sixth column (Debounce): the Debounce Count for the point. See *Debounce Count* in the *D7212G Program Entry Guide* (P/N: 4998138538).
- Seventh column (BFSK/Relay Entry): the BFSK/Relay report code. It is the point number reported for this point when the panel is using the BFSK format. Additionally, this may be used as a summary relay option (see *Point Assignment* in the *D7212G Program Entry Guide* [P/N: 4998138538]).
- Eighth column (Custom Point Text): the text displayed at command centers for the point. The text is transmitted to the receiver when the panel is using the Modem IIIa[2] format.

D7212G Default values are shown in ( ) or in **bold**

RADXPNTS Handler

Point Assignments (001 through 040)

POPIT Switch Setting	Trans-lation	Point #	Point Index	Area Assign	Debounce	BFSK/ Relay	Custom Point Text
	100	001	__ __	(1) ____	(2) ____	(1) ____	P1 FIRE ____
	200	002	__ __	(1) ____	(2) ____	(2) ____	P2 PANIC ____
	300	003	__ __	(1) ____	(2) ____	(3) ____	P3 DELAY ____
	400	004	__ __	(1) ____	(2) ____	(4) ____	P4 FOLLOW ____
	500	005	__ __	(1) ____	(2) ____	(5) ____	P5 INSTANT ____
	600	006	__ __	(1) ____	(2) ____	(6) ____	P6 INSTANT ____
	700	007	__ __	(1) ____	(2) ____	(7) ____	P7 INSTANT ____
	800	008	__ __	(1) ____	(2) ____	(8) ____	P8 INSTANT ____
0 1 2 3 4 5 6	101	009	__ __	(1) ____	(2) ____	(1) ____	P9 ____
0 1 2 3 4 5 _	102	010	__ __	(1) ____	(2) ____	(1) ____	P10 ____
0 1 2 3 4 _ 6	103	011	__ __	(1) ____	(2) ____	(1) ____	P11 ____
0 1 2 3 4 _ _	104	012	__ __	(1) ____	(2) ____	(1) ____	P12 ____
0 1 2 3 _ 5 6	105	013	__ __	(1) ____	(2) ____	(1) ____	P13 ____
0 1 2 3 _ 5 _	106	014	__ __	(1) ____	(2) ____	(1) ____	P14 ____
0 1 2 3 _ _ 6	107	015	__ __	(1) ____	(2) ____	(1) ____	P15 ____
0 1 2 3 _ _ _	108	016	__ __	(1) ____	(2) ____	(1) ____	P16 ____
0 1 2 _ 4 5 6	109	017	__ __	(1) ____	(2) ____	(1) ____	P17 ____
0 1 2 _ 4 5 _	110	018	__ __	(1) ____	(2) ____	(1) ____	P18 ____
0 1 2 _ 4 _ 6	111	019	__ __	(1) ____	(2) ____	(1) ____	P19 ____
0 1 2 _ 4 _ _	112	020	__ __	(1) ____	(2) ____	(1) ____	P20 ____
0 1 2 _ _ 5 6	113	021	__ __	(1) ____	(2) ____	(1) ____	P21 ____

Figure 14: Program Record Sheet

POPIT Labels

Off-board points for the D7212G are numbered 9 to 40.

Two sheets of peel-off POPIT labels are supplied with the D8125 POPEX Module. Use the sheet marked *Bank1* for Points 9 to 40.

Each label has two parts. Place the smaller part, with just the point number on it, on the chip. Place the larger part with the switch settings on the base of the POPIT. Set the switches and cover the POPIT.

Do not program two POPITs for the same point number. After programming all the points, perform a service walk test. The *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide* (P/N: 43700) contains instructions for performing a service walk test. If a point does not test, check the programming for a duplicated address.

Walk test does not show extra points: If the point assignment switches on a POPIT or OctoPOPIT are set incorrectly, it may create both missing and extra point conditions. If the same point number is assigned to two or more POPITs or OctoPOPITs, none of the points with that number will test correctly. Refer to *Section 8.1 Point (ZONEX) Bus D7212G Terminals 27 to 28* on page 37 for additional infomation on how to troubleshoot POPITs or extra point conditions.

8.4 D8128D OctoPOPIT Module

IMPORTANT

D8128, D8128A or D8128B modules are not compatible with the D7212G. Only use the D8128D OctoPOPIT module. Using D8128, D8128A or D8128B modules may cause intermittent missing and restoral reports.

8.4.1 Description

The D8128D OctoPOPIT Module combines the functions of the D8125 POPEX module and the D8127/D9127 POPIT modules to provide eight off-board points in a single module. You can wire both D8128D OctoPOPIT and D8125 POPEX modules in parallel to the ZONEX Bus terminals on the same panel.

Review *Section 5.0 Power Outputs* on page 29 to be sure to provide enough power for the OctoPOPITs and other powered devices that will be connected to the system.

8.4.2 Listing

The D8128D OctoPOPIT Module is UL Listed for Local or Police Connected Burglary Alarm, Central Station Burglary Alarm, and Household Burglary Alarm applications. The D8128D is also suitable for fire supervisory applications, such as indicating circuit supervision (using the D192C/D192G Bell Circuit Supervision Module), sprinkler supervision, and valve tamper protection.

Do not connect fire alarm initiating devices directly to the D8128D.

You must use the D125B Dual Class B Powered Loop Interface Module or D129 Dual Class A Initiation Circuit Module for fire initiation applications. Connect the initiating devices, smoke detectors for example, to the D125B powered loops or D129 Class A loops.

Connect the zone outputs on the D125B or D129 to the OctoPOPIT sensor loop inputs. The D125B or D129 and the OctoPOPIT must be mounted in the enclosure with the panel or in a separate enclosure connected to the panel's enclosure by conduit no longer than 20 ft. (6 m).

8.4.3 Installing the OctoPOPIT

You can install the D8128D OctoPOPIT Module in the enclosure with the panel, or in a separate enclosure (D8103, D8108A, or D8109) up to 200 ft. (61 m) from the panel, using standard four-conductor 22 AWG (0.8 mm) wire. If you mount the OctoPOPIT in a separate enclosure, use shielded cable to avoid electro-magnetic interference. See *EMI on Long Wire Runs* in the *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide* (P/N: 43700).

Tampered enclosures for UL Certificated systems: The D125B or D129 and the OctoPOPIT must be mounted in the enclosure with the panel or in a separate enclosure connected to the panel's enclosure by conduit not more than 20 ft. (6 m) in length.

Mounting

Follow the procedure below to install OctoPOPITs in the enclosure.

1. It is easier to set the switches on the D8128D before mounting it in the enclosure. See *Section 8.4.5 Line Termination* below and *Section 8.4.7 Address Assignment Switches* on page 44.
2. Align the OctoPOPIT Module with any of the four mounting locations in the enclosure. See *Figure 2* on page 21.
3. Use the screws provided with the module to secure it in the enclosure.
4. Use the D137 Mounting Bracket to install OctoPOPITs in enclosures with no module mounting locations available.

8.4.4 Wiring OctoPOPITs

Follow the procedure below to wire D8128D OctoPOPIT Modules to the D7212G. Both OctoPOPIT and POPEX Modules can be connected to the same Point Bus terminals. The modules wire in parallel. Remember, never assign the same point number to more than one point.

1. *Power down first:* Power down the panel by disconnecting the positive (red) battery lead at the battery and unplugging the transformer.
2. Connect Terminal 1 on the OctoPOPIT to Terminal 9 on the D7212G.
3. Connect Terminal 2 on the OctoPOPIT to Terminal 28 on the panel if assigning point numbers from 9 to 40 to this OctoPOPIT. See *Section 8.4.7 Address Assignment Switches* on page 44.
4. Connect Terminal 3 on the OctoPOPIT to Terminal 27 on the D7212G.
5. Connect Terminal 4 on the OctoPOPIT to Terminal 3 on the D7212G.
6. See *Section 8.4.6 OctoPOPIT Sensor Loops* on page 44 for instructions on connecting devices to the OctoPOPIT's sensor loops.

8.4.5 Line Termination

Switch 5 sets line termination.

If there is:

- No D8125 POPEX module connected to ZONEX 1, set switch 5 of only one D8128D connected to those terminals to the ON position.
- A D8125 POPEX module connected to ZONEX 1, set switch 5 of all D8128Ds connected to those terminals to the OFF position.

See *Figure 15* on page 45 for the location of the switches on the OctoPOPIT.

8.4.6 OctoPOPIT Sensor Loops

Only the resistance on the loop limits the number of normally-open and/or normally-closed detection devices each sensor loop can supervise. Resistance on each sensor loop must be less than 100 Ω with the detection devices connected.

Certain UL and NFPA applications may limit the number of detection devices. Consult the appropriate UL or NFPA standards.

The OctoPOPIT detects open, short, normal, and grounded circuit conditions on its sensor loops and transmits the conditions to the panel. Each sensor loop is assigned a point number and transmits to the panel separately.

Bosch Security Systems recommends you use twisted-pair wire for the OctoPOPIT sensor loops to avoid EMI problems. Run wires away from the premises telephone and AC wiring. If you suspect a noisy environment, use shielded cable.

There are two rows of terminal numbers on the OctoPOPIT. In the row closest to the terminal blocks, the positive outputs for the sensor loops are labeled P1 to P8. Sensor loop outputs P1 and P2, P3 and P4, P5 and P6, and P7 and P8 share common terminals. The common terminals for each pair are labeled COM.

Terminate each OctoPOPIT sensor loop with a 1 kΩ end-of-line resistor. Attach a resistor even if you don’t enable the loop. The OctoPOPIT comes with a D105BL resistor for each sensor loop.

Take care not to duplicate point assignments. Points assigned to both an OctoPOPIT sensor loop and a POPIT, two OctoPOPIT sensor loops, or two POPITs do not function properly.

8.4.7 Address Assignment Switches

Switches 1, 2, 3, and 4 assign the OctoPOPIT sensor loops to point numbers on the panel. *Table 10* shows the OctoPOPIT switch settings for point assignments.

ZONEX 1	D8128D Address Switches				
Points 9-127	1	2	3	4	5
9-16	ON	ON	ON	ON	*
17-24	ON	ON	ON	OFF	*
25-32	ON	ON	OFF	ON	*
33-40	ON	ON	OFF	OFF	*

**Line Termination Switch (see section 8.4.5 Line Termination, page 45 for line termination switch settings).*

Table 10: D8128D OctoPOPIT Switch Settings for D7212G

8.5 Testing Off-board Points

Use the Service Walk Test to test off-board points. See the *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide* (P/N: 43700) for instructions. Test to be sure that all off-board points operate properly.

Walk test does not show extra points: If the point assignment switches on a POPIT or OctoPOPIT are set incorrectly, it may create both missing and extra point conditions. If the same point number is assigned to two or more POPITs or OctoPOPITs, none of the points with that number will test correctly. Refer to *Section 8.1 Point (ZONEX) Bus D7212G Terminals 27 to 28* on page 37 for additional infomation on how to troubleshoot POPITs or extra point conditions.

Refer to *Section 8.4.7 Address Assignment Switches* on page 44 for information on how these switch settings are made.

Refer to *Section 8.4.5 Line Terminmation* on page 43 for additional information on how to set Switch 5.

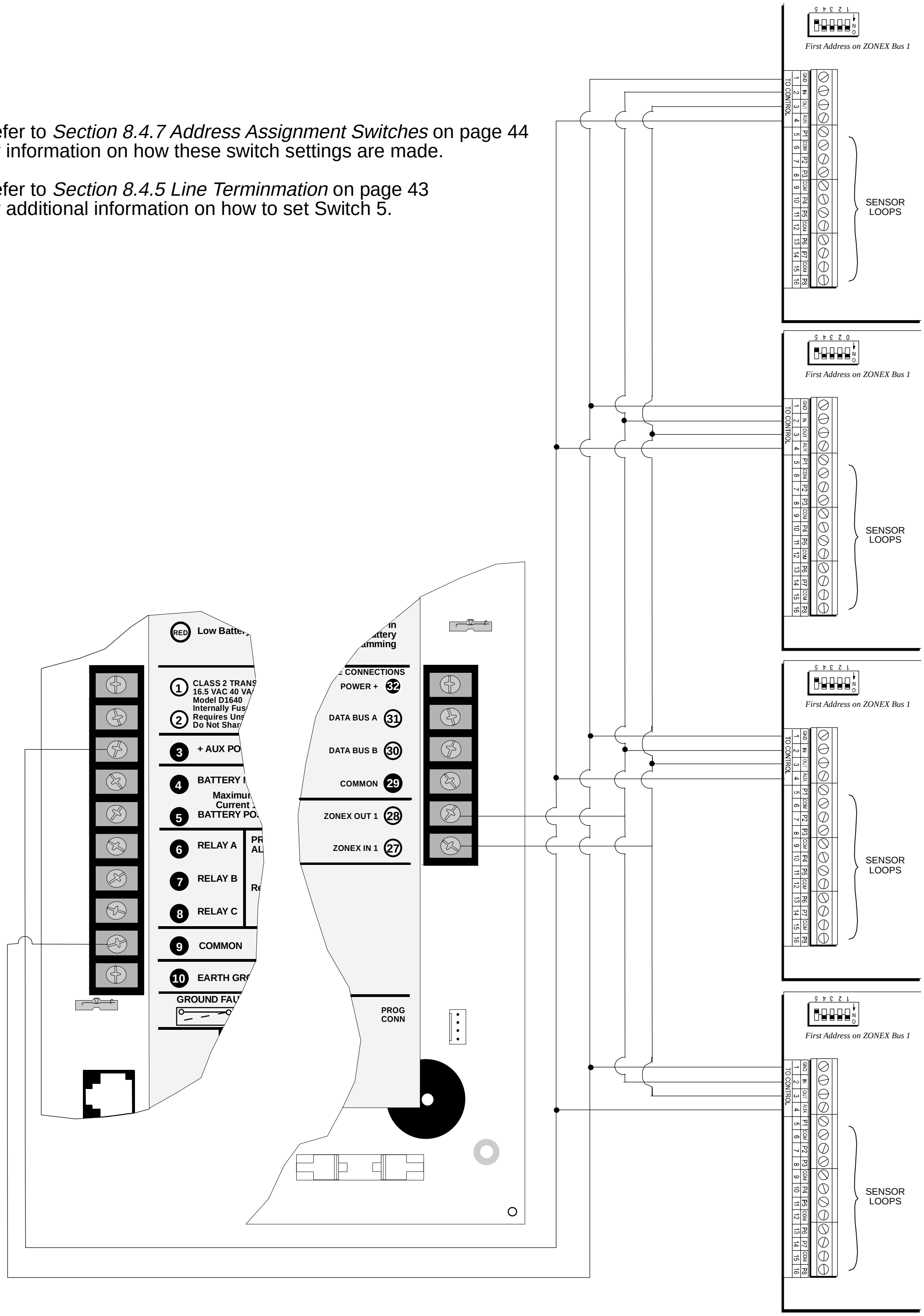


Figure 15: Connecting D8128D OctoPOPITs to the D7212G

Off-board Points

Notes:

9.0 Off-board Relays

9.1 D8129 OctoRelay

The D8129 OctoRelay allows the addition of relay outputs to the system in groups of eight. The D7212G allows up to 24 OctoRelay outputs to be added to the system. Review *Section 5.0 Power Outputs* on page 29 to be sure to provide enough power for the OctoRelays and other powered devices that will be connected to the system.

OctoRelays for relay numbers 1 to 24 connect to ZONEX 1, Terminal 28. See *Figure 16* on page 48.

Alarm output, auxiliary relay, sensor reset, arming status, point status, alarm memory, or remote functions can be assigned to the OctoRelay outputs individually. See *Relay Parameters* in the *D7212G Program Entry Guide* (P/N: 4998138538) for programming details.

D8129 restricted for fire systems: The D8129 relay outputs are not supervised and can not be used in fire or combined fire/burglary installations for primary indicating devices.

9.1.1 Configuring the D8129 OctoRelay

Five switches on the OctoRelay determine the relay numbers for the eight relay outputs. Refer to *Table 11*.

Panel Relay Number	D8129 OctoRelay Switch Setting	D8129 OctoRelay Switch Setting
1 to 8	Off-On-On-On-On	ZONEX 1 Terminal 28
9 to 16	On-Off-On-On-On	ZONEX 1 Terminal 28
17 to 24	Off-Off-On-On-On	ZONEX 1 Terminal 28

Table 11: D8129 OctoRelay Switch Settings

CAUTION

Relay outputs may activate while you are setting the OctoRelay switches or programming the panel. You may wish to disconnect equipment connected to relay outputs before performing these functions.

9.1.2 Relay Outputs

Each OctoRelay output provides a Form C dry contact rated for 1.0 A at 12 VDC. Normally-open, common, and normally-closed terminals are available for each relay output. When an individual output is activated, there is continuity between the normally-open and common terminals. When the output is not activated, there is continuity between the normally-closed and common terminals.

9.1.3 Installation

Set the switches on the OctoRelay before installing it in the enclosure. See *Section 9.1.1 Configuring the D8129 OctoRelay*. Install the OctoRelay in the enclosure with the panel (see *Figure 2* on page 21) or in an adjacent enclosure not more than 5 ft. (1.5 m) from the panel. Use 16 to 22 AWG wire.

Follow the procedure below to install OctoRelays in the enclosure with the panel.

1. Align the module with one of the mounting locations in the enclosure. See *Figure 2* on page 21.
2. Use the screws provided with the module to secure it in the enclosure.

   Use the D137 Mounting Bracket or D9002 Mounting Skirt to install OctoRelays in enclosures with no module mounting locations available.

9.1.4 Wiring Connections

Power down the panel to connect OctoRelays as shown in *Figure 16* on page 48. Note that OctoRelays for relay numbers 1 to 24 connect to ZONEX 1, Terminal 28.

Only one OctoRelay is shown wired to each ZONEX bus in *Figure 16*. Wire additional OctoRelays in parallel. Review *Section 5.0 Power Outputs* on page 29 to be sure to provide enough power for the relays.

Off-board Relays

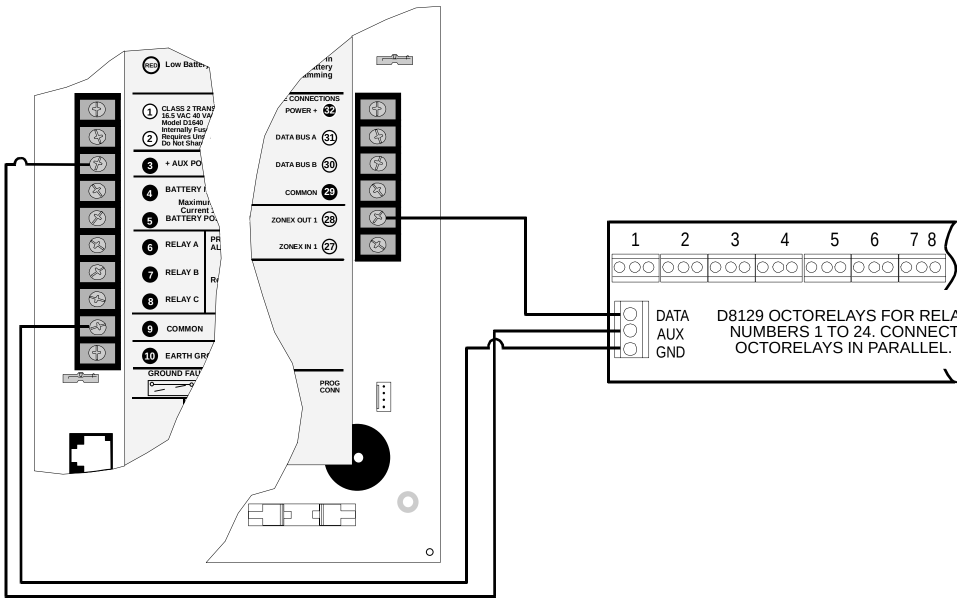


Figure 16: D8129 Connections to the D7212G

10.0 Arming Devices

10.1 Description

Command centers, maintained or momentary contact keyswitches, or a combination of the two are used to arm and disarm areas. The panel may contain up to 4 areas. See *Section 2.4.2 Areas and Accounts* on page 17 for a description of areas.

10.2 Command Center Terminals ㉙ to ㉜

The Bosch Security Systems command center is a 4-wire powered device used to arm and disarm areas, annunciate complete system status, initiate system tests, and control many functions of the security system.

The system can supervise up to eight command centers. The panel transmits a serial device trouble report, `SDI FAILURE` in the Modem IIIa^2 format or `TROUBLE ZN D` in the BFSK format, if it loses communication with a supervised command center. `CALL FOR SERVICE` appears in any command center with text display capability that loses communication with the panel. `SERVC KEYPAD` appears at all other command centers connected to the system.

A total of 32 command centers can be connected to the system. The number of supervised command centers, number of areas, and the available power affect the total number of command centers that can be connected to the system. See *Command Center* in the *D7212G Program Entry Guide* (P/N: 4998138538) for complete programming details on command center options.

There are five types of command centers available for use with the system:

- D1255: 16-character alphanumeric display for general use.
- D1256: text display command center with functional keys optimized for local fire alarm control.
- D1257: text display command center for fire annunciation.
- D1260: Easy-to-read 4-line by 20-character LCD display with eight "Soft" keys for displaying simple selections.
- D720: LED display command center appropriate for use as a single area command center with up to eight points.

The D1255 and D720 are also available in white (D1255W and D720W) or red (D1255R and D720R) versions.

See the command center's *User's Guide* for operational information.

10.2.1 Assigning the command center an address

Switches on the command center assign an address (1 to 8) to the command center. The address determines if the command center is supervised, the command center's scope, and what area the command center is assigned to. See *Command Center Assignment* in the *D7212G Program Entry Guide* (P/N: 4998138538) for a complete description of addresses.

Table 12 shows the correct switch setting for each address.

Address	Switch					
	1	2	3	4	5	6
Address #1	ON	ON	ON	ON	Encoding Tone ON/OFF	ON
Address #2	OFF	ON	ON	ON		ON
Address #3	ON	OFF	ON	ON		ON
Address #4	OFF	OFF	ON	ON		ON
Address #5	ON	ON	OFF	ON		ON
Address #6	OFF	ON	OFF	ON		ON
Address #7	ON	OFF	OFF	ON		ON
Address #8	OFF	OFF	OFF	ON		ON

Table 12: Command Cneter Address Settings

10.2.2 Installation

Consult the command center *Operation and Installation Guide* for installation and mounting instructions. Command centers connect to the panel in parallel as shown in *Table 13*.

D7212G		Command Center	
Terminal	Function	Wire Color	Function
32*	POWER +	Red	12 VDC
31	DATA BUS A	Yellow	Data-In
30	DATA BUS B	Green	Data-Out
29	COMMON	Black	Common

** Connect with at least 5 ft. (1.5 m) of 22 AWG wire (14 ft. [4.3 m] of 18 AWG wire).*

Table 13: Command Center Connections

Switching the green and yellow wires affects other command centers: Incorrectly connecting the green wire from the command center to Terminal 31 and the yellow wire to Terminal 30 causes other command centers connected to the panel to go blank and/or sound random beep tones.

Devices can be connected to the data bus, Terminals 30 and 31, by parallel wire runs from the panel to each device, wire from device to device, or a combination of the two as long as a maximum of 15000 ft. (4572 m) of 22 AWG wire *for all devices connected to the SDI Bus combined* is used.

It is recommended, however, that command centers be limited to 2000 ft. (610 m) per run and the D9131A be limited to 1000 ft. (305 m) per run.

Extra power needed for more command centers: The D1255 Command Center draws 104 mA when it is idle. It draws 206 mA with the keys lit and the sounder activated. Review *Section 5.0 Power Outputs* on page 29 to determine the total power output requirements for the system.

One or more D8132 Battery Charger/Power Supply Modules may need to be added for the number of command centers that will be used. *Figure 17* shows the D8132 powering command centers in a stand-alone configuration.

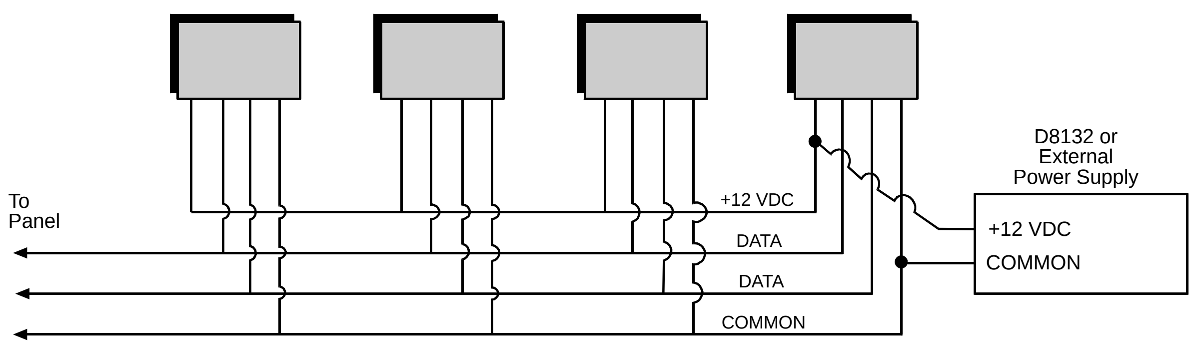


Figure 17: Power at Command Centers

For UL certificated accounts, use a UL Listed power supply. The D8132 is not UL Listed as a stand-alone power supply.

Application Tip

Control/Communicator and D8132 (or other power supply) must share COMMON:
Note that Figure 17 *shows the common from the D8132 Module connected to both the command centers' common and the common on the control/communicator. Any stand-alone power supply powering any device connected to the panel must also be connected to a common terminal on the panel.*

CAUTION

If you are using the Ground Fault Detect capability on the D7212G Control/Communicator and *an external power supply:*
Make sure that the external power supply selected isolates its Earth Ground connection from the negative side of the Aux Power output. External power supplies that do not isolate Earth Ground will cause ground fault conditions on the control/communicator.

10.3 D279A Independent Zone Control

Any *on-board* or *OctoPOPIT* point can be programmed so that the D279A Independent Zone Control operates as independent point control (arms and disarms the point).

- See the *Point Assignments* in the *D7212G Program Entry Guide* (P/N: 4998138538) for programming information.
- See the *D279A Operation and Installation Guide* (P/N: 46456) for wiring and operation instructions.

10.4 Keyswitch

10.4.1 Description

A maintained or momentary contact arming station (keyswitch) can be connected to master arm/disarm any of the areas in the system. The keyswitch is connected to an on-board or off-board point's sensor loop. Relays can be programmed to activate arming status LEDs for keyswitch arming stations. See *Relays* in the *D7212G Program Entry Guide* (P/N: 4998138538).

10.4.2 Programming

See *Point Assignments* in the *D7212G Program Entry Guide* (P/N: 4998138538) for the correct programming for points used for keyswitches.

10.4.3 Installation

For maintained switches, connect the end-of-line resistor for the point at the keyswitch so that the switch opens the circuit when it operates. A short on the circuit produces an alarm if the area is armed and a trouble if it is disarmed. See *Figure 18*.

For momentary switches, connect the end-of-line resistor for the point at the keyswitch so that the switch shorts the resistor when it operates. An open on the circuit produces an alarm if the area is armed and a trouble if it is disarmed. See *Figure 18*.

10.4.4 Keyswitch Operation

Maintained Contact

If the point to which the keyswitch is connected is programmed for a maintained contact, an open on the arming circuit arms the area. All faulted points are force armed, regardless of the entry in the *FA Bypass Max* program item. Returning the circuit to normal disarms the area. See *Area Parameters* and *Point Assignments* in the *D7212G Program Entry Guide* (P/N: 4998138538).

Momentary Contact

If the point to which the keyswitch is connected is programmed for a momentary contact, shorting the arming circuit toggles the area's arming state between armed and disarmed. All faulted points are force armed, regardless of the entry in the *FA Bypass Max* program item. See *Point Assignments* in the *D7212G Program Entry Guide* (P/N: 4998138538).

Silencing the Bell

To silence the bell (stop Alarm Bell output) if the system is armed, operate the keyswitch to disarm the area. If the area is disarmed, operate the keyswitch once to start the arming process and a second time to stop the arming process and silence the bell.

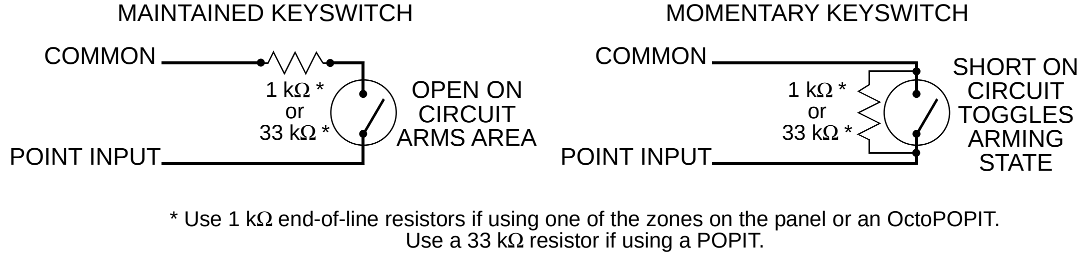


Figure 18: Keyswitch Wiring

Notes:

11.0 SDI Devices

11.1 Description

The D7212G Panel can support a number of accessory devices off the SDI bus using Terminals 29 through 32. Some devices include the Command Centers (discussed in the previous section), the D9131A Parallel Printer Interface Module, the D9133 Serial Interface Module, the D9133DC Direct Connect Module, and the D9133TTL-E Network Interface Module.

11.2 Installation

Consult the *Operation and Installation Guide* of the specific SDI device for complete installation instructions. SDI devices connect to the panel in parallel as shown in *Table 14*.

These devices may share power with the panel or be powered by a stand-alone power source.

D7212G		SDI Devices	
Terminal	Function	Wire Color	Function
32	POWER +	Red	+12 VDC
31	DATA BUS A	Yellow	Data-In
30	DATA BUS B	Green	Data-Out
29	COMMON	Black	Common

Table 14: SDI Device Connections

IMPORTANT

A stand-alone power supply powering any SDI device must also be connected to a common terminal on the panel. Do not connect the stand-alone power supply's earth ground to Terminal 10 on the panel.

11.3 D9131A Parallel Printer Interface Module

The Bosch Security Systems D9131A Parallel Printer Interface Module is a 4-wire powered device used to connect a standard parallel printer to a panel. The D7212G can supervise one printer. Each printer requires a separate D9131A Parallel Printer Interface Module. The D9131A connects to the printer using a standard parallel printer cable.

11.3.1 Switch Settings

Switches on the D9131A assign the address to the printer. The address determines if the printer is supervised, the printer's scope, and the area to which the printer is assigned. See *Printer Parameters* in the *D7212G Program Entry Guide* (P/N: 4998138538) for a complete description of addresses.

Table 15 shows the correct switch setting for Address 17.

Printer	Switch					
	1	2	3	4	5	6
17	ON	ON	ON	*	ON	ON
* ON = Header and Form Feed						
OFF = No Header and No Form Feed						

Table 15: Printer Address Switch Settings

11.3.2 Supervision

Supervision includes proper operation of the SDI bus, proper connection of the printer cable between the printer and the D9131A, printer paper supply, printer selected (on-line), and printer power.

The panel sends an SDI failure report to the receiver if it fails to communicate with the printer interface, and `SERVC PRINTER` displays at the command center. The report to the receiver includes the address of the troubled D9131A to indicate which printer needs service.

If an SDI device is supervised and SDI A becomes disconnected, the device may still operate normally, depending upon environmental conditions.

11.4 SDI Address 80

SDI Address 80 is available on the D7212G Panel and allows bi-directional SDI to RS232 information. The intent of this address is for use with home or building automation software. A D9133 Serial Interface Module is required for this application.

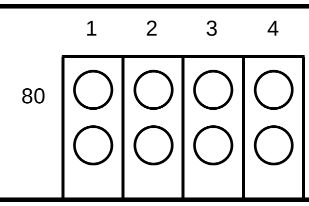
11.4.1 D9133 Serial Interface Module

The Bosch Security Systems D9133 Serial Interface Module is a four-wire powered SDI device providing connection for RS232 devices to the D7212G panel. The D9133 uses a specific communication protocol that is provided upon request. Please contact Bosch Security Systems Technical Support at (888) 886-6189.

The D9133 can be installed up to 1000 ft. (305 m) away from the panel using 18 AWG wire. The D9133 is not UL Listed.

D9133 Serial Interface Module

There are no jumper settings required for the D9133 (SDI Address 80) for home or building automation purposes. All Jumper shunts must be removed for this setting.



11.4.2 Address Settings

11.4.3 Supervision

The supervision of the D9133 is available through programming which includes proper operation between the D9133 and the control panel.

If supervised and the D9133 does not respond to panel supervision polls, the panel sends an SDI failure report to the receiver if it fails to communicate with the D9133 and `SERVC SDI 80` displays at the command center. The report to the receiver includes the address of the troubled module to indicate which module needs service.

11.5 SDI Address 88

SDI Address 88 is available with the D7212G Panel and is used for several different applications. When using SDI Address 88, only <u>one</u> of the listed devices may be connected at a time.

11.5.1 D9133DC Direct Connect Programming Module

The D9133DC Direct Connect Programming Module can be used to locally program the D7212G panel. In addition to this, the D9133DC allows Diagnostics and History retrieval to be performed. The D9133DC is not UL Listed.

11.5.1.1 Connecting the D9133DC

1. Configure the D9133DC for SDI Address 88. To program the panel when the reset pin is in the unlocked position, program *Enable SDI RAM* to Yes in the RADXAUX1 handler.
2. Connect the D9133DC to Com Port 1 or Com Port 2 on the PC. The D9133DC has a DB-9 female serial connector. A null modem cable must be purchased separately to connect the D9133DC to a PC.
3. Using 22 AWG or 18 AWG wire, connect the D9133DC SDI terminals (SDI PWR, SDI A, SDI B, and SDI COM) to the panel's SDI terminals (Terminals 29 to 32).

To send or receive the panel's program, the Reset Pin can be in the Locked or Unlocked position.

Note: *Locking the Reset Pin when programming the panel improves upload/download time.*

11.5.1.2 Used as an External Modem

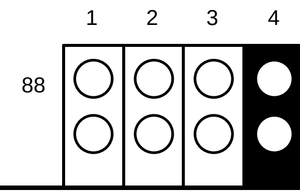
The D9133DC can also be used as an external modem when using RAM IV with the panel. Please see the *D7212G Program Entry Guide* (P/N: 4998138538) for programming details.

11.5.2 D9133TTL-E Network Interface Module

The Bosch Security Systems D9133TTL-E Network Interface Module is a four-wire powered SDI device providing connection for bi-directional communication over Ethernet networks to D7212G Panels. For programming information on enhanced communications, please refer to the *D7212G Program Entry Guide* (P/N: 4998138538).

The D9133TTL-E can be installed up to 1000 ft. (305 m) away from the panel using 18 AWG wire.

11.5.3 Address Settings

D9133TTL-E Network Interface Module A jumper must be placed over Pin 8 for the D9133TTL-E (SDI Address 88) to be used for RAM IV and/or enhanced communications in a LAN/WAN environment.	

11.5.4 Supervision

Supervision of the D9133DC and D9133TTL-E at SDI Address 88 is available through programming that ensures operation between the module and the control panel.

If supervised and the module does not respond to panel supervision polls, `SERVC SDI 88` displays at the command center. The report to the receiver includes the address of the troubled module to indicate which module needs service.

Notes:

12.0 Programmer and Accessory Connections

12.1 Programmer Connector

The procedure below shows how to connect and disconnect the programmer. Refer to the *D5200 Programmer Manual* (P/N: 74-06176-000) for complete information on using the D5200 programmer.

1. *Lock Reset Pin:* See *Figure 19*.
2. Connect the D5200 Data/Power cord into the programmer connector (refer to *Figure 20* on page 58).
3. Perform the desired programming function (send or receive program).
4. Disconnect the programmer.

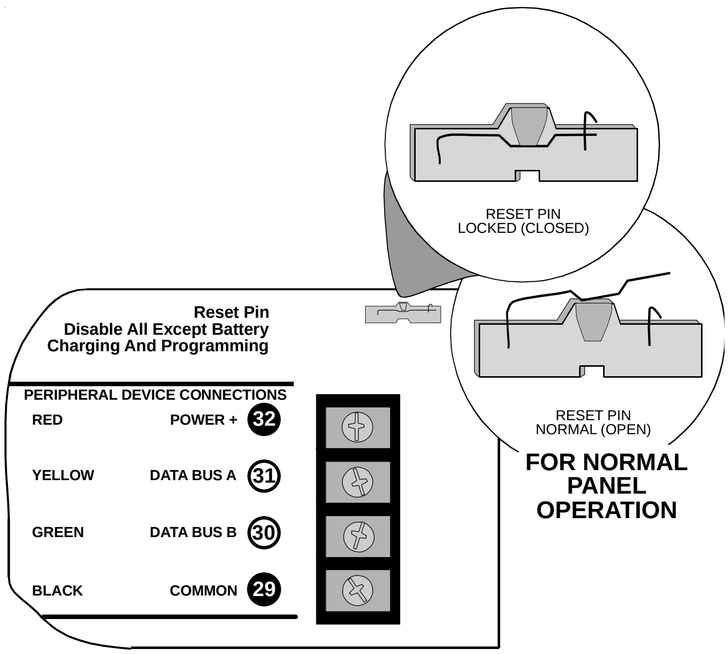


Figure 19: Reset Pin

12.1.1 Programmer Access Reports

When a program is sent to the panel, the panel sends a `PROG ACCESS OK` report ten seconds after the handler is exited or when the programmer is disconnected. The prompt in Routing must be programmed Yes for this report to be sent.

12.2 Accessory Connector

The Accessory Connector is not used on the D7212G Control/Communicator.

Programmer and Accessory Connections

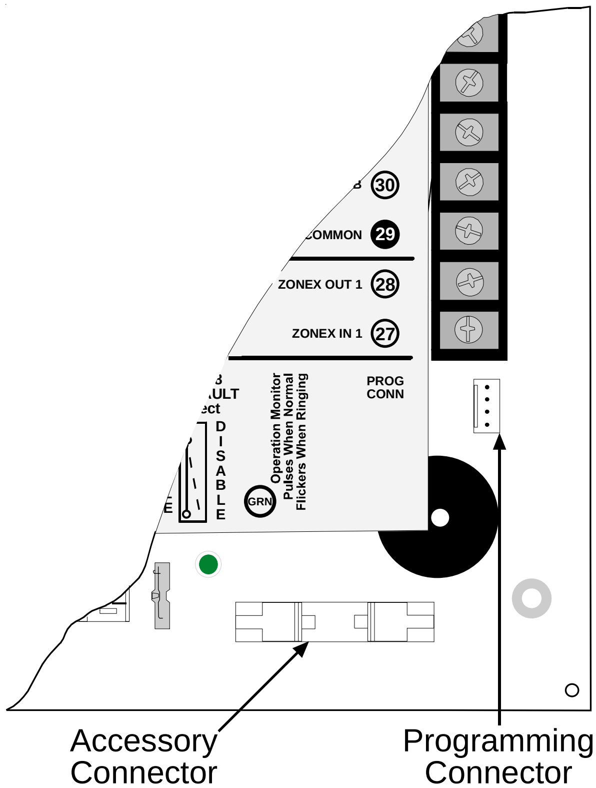


Figure 20: Programmer and Accessory Connections

13.0 Faceplate

13.1 D7212G Faceplate

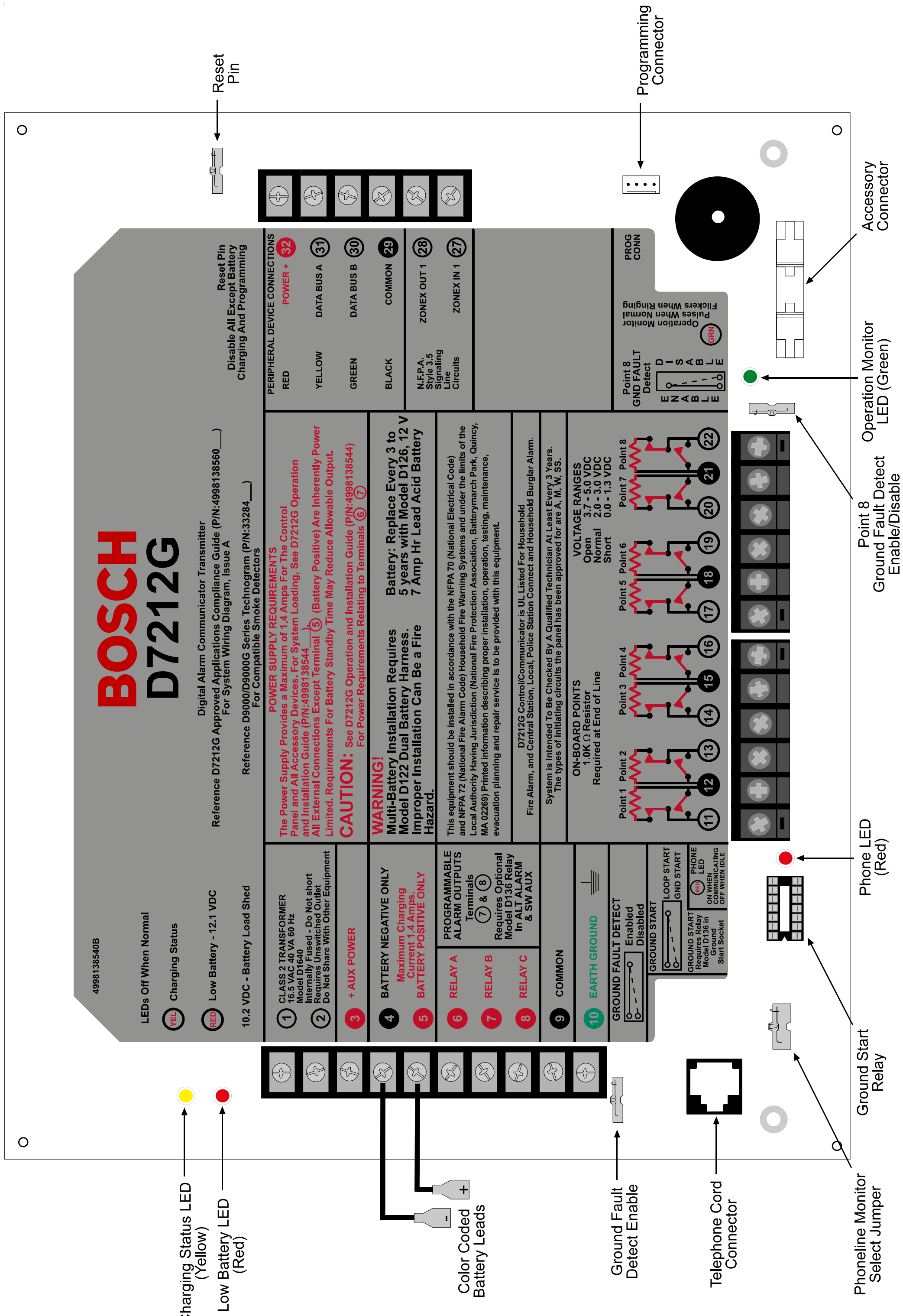


Figure 21: D7212G Faceplate

Faceplate

Notes:

Appendix A: System Wiring Diagrams, Issue A

A.1 D7212G Control/Communicator, 1 of 3

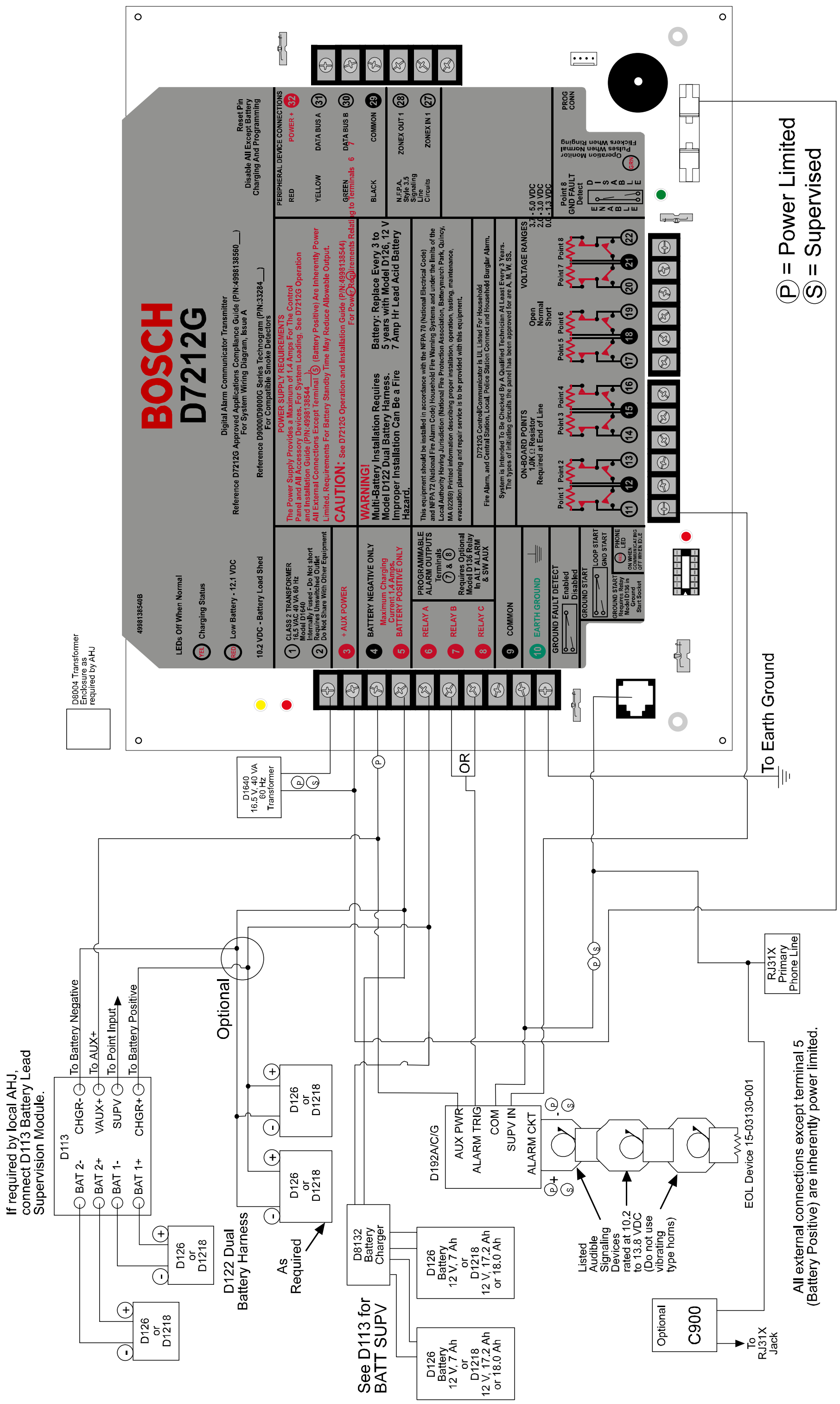


Figure 22a: D7212G System Wiring Diagram, 1 of 3

Appendix A: System Wiring Diagrams, Issue A

A.2 D7212G Control/Communicator, 2 of 3

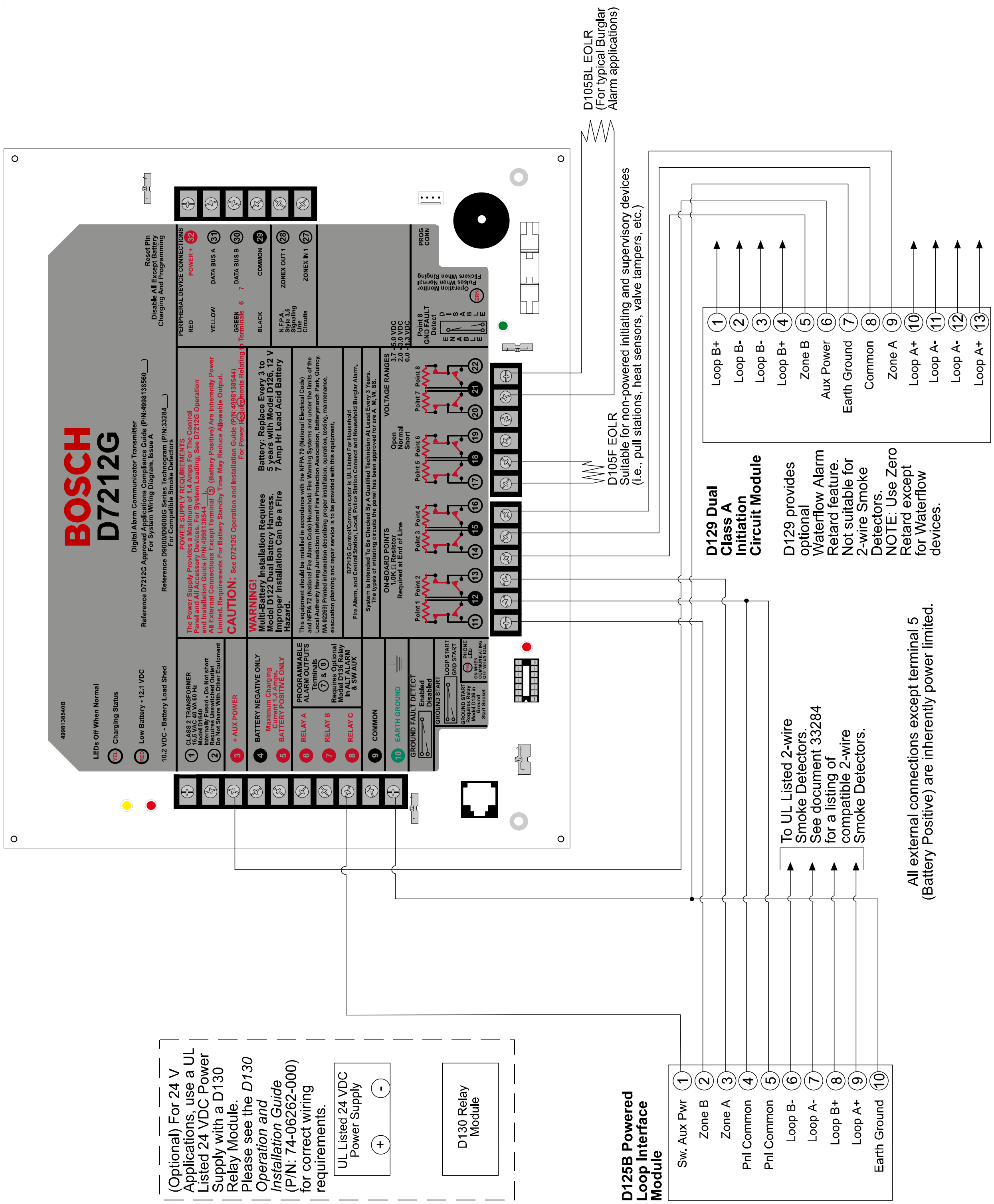


Figure 22b: D7212G System Wiring Diagram, 2 of 3

A.3 D7212G Control/Communicator, 3 of 3

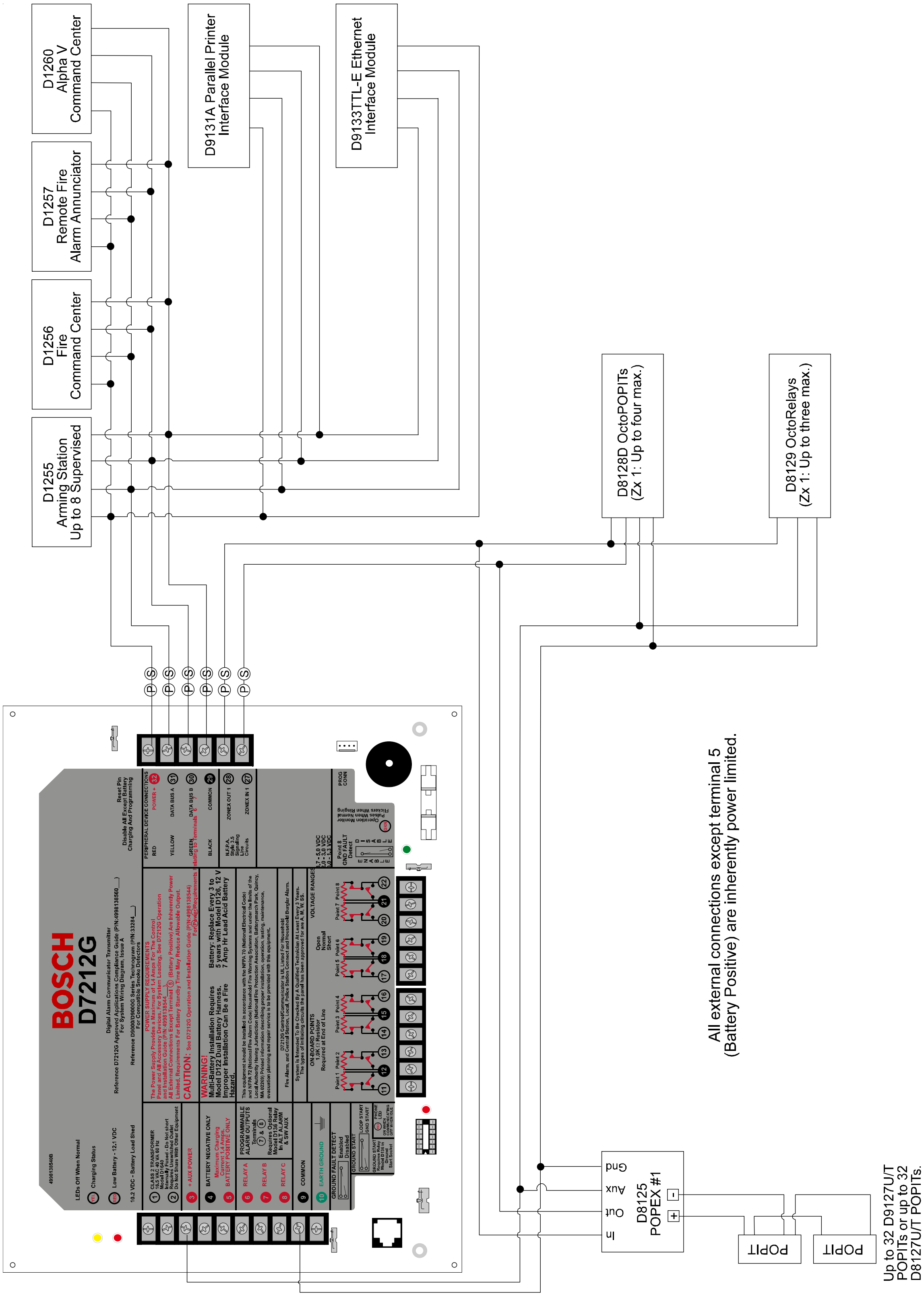


Figure 22c: D7212G System Wiring Diagram, 3 of 3

Appendix A: System Wiring Diagrams, Issue A

Notes:

Appendix B: Point Address Chart

B.1 ZONEX 1, Points 9 to 40

Place the labels on the base of the POPIT. Do not attach labels to the POPIT cover.

A number in the switch column indicates that the switch is set to ON.

D8127 or D9127 POPITs may be used for Points 9 to 40. D8127 POPITs have dipswitches 1 to 6, whereas D9127 POPITs have dipswitches 0 to 6.

	Switch						
Address	0	1	2	3	4	5	6
009	0	1	2	3	4	5	6
010	0	1	2	3	4	5	
011	0	1	2	3	4		6
012	0	1	2	3	4		
013	0	1	2	3		5	6
014	0	1	2	3		5	
015	0	1	1	3			6
016	0	1	2	3			
017	0	1	2		4	5	6
018	0	1	2		4	5	
019	0	1	2		4		6
020	0	1	2		4		
021	0	1	2			5	6
022	0	1	2			5	
023	0	1	2				6
024	0	1	2				
025	0	1		3	4	5	6
026	0	1		3	4	5	
027	0	1		3	4		6
028	0	1		3	4		
029	0	1		3		5	6
030	0	1		3		5	
031	0	1		3			6
032	0	1		3			
033	0	1			4	5	6
034	0	1			4	5	
035	0	1			4		6
036	0	1			4		
037	0	1				5	6
038	0	1				5	
039	0	1					6
040	0	1					

Table 16: ZONEX 1 Point Address Chart

Appendix B: Point Address Chart

Notes:

Symbols

A

B

C

D

E

F

G

I

K

L

N

O

P

R

S

T

V

W

Z